

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Compaq
on the
Attack

Compaq shakes up server market with \$3B Tandem acquisition. Page 6.



IP calling

Internet telephony is your ticket to cost savings and voice/data integration.

By Daniel P. Dorn and Paul Desmond

The phrase "Internet telephony" often conjures images of computer fanatics plugging voice boards into PCs so they can talk "for free" to like-minded sorts around the world at odd hours — the Internet equivalent of ham radio operators. Or maybe it's an image of some huckster hawking cheapo international phone calls that are mysteriously transported over the Internet. Well, get such images right out of your head because that's ancient history.

See IP, page 45

KATHERINE STREETER

The shrinking world of ATM

Cell technology getting squeezed out of campus backbones.

By Jodi Cohen

San Jose, Calif.

ATM, once considered the ultimate end-to-end enterprise network technology, is getting pushed out of the campus network picture.

ATM's world is shrinking because of the emergence of Gigabit Ethernet, frame-based quality-of-service (QoS) features and IP switching, according to a sampling of the 4,000 attendees at this week's ATM Year '97 show here.

At last year's show, attendees basically conceded the desktop LAN market to technologies other than ATM.

"Now that the end-to-end utopian idea of ATM is gone, why bother with cells anywhere in the LAN?" asked Steve Bell,

GET OUT OF HERE

What's pushing ATM out of the campus backbone:

Gigabit Ethernet — This emerging technology carries data at 1G bit/sec while retaining the Ethernet frame format common among most LANs.

Quality of service — Although once limited to the ATM world, QoS capabilities soon will be available in Gigabit Ethernet switches using new protocols such as the Resource Reservation Protocol.

IP Switching — Originally proposed by Ipsilon Networks as an ATM-centric method of zipping IP traffic across a network, the technology is now being used to switch IP directly via a frame switch or gigabit router.

Bay to boost frame and cell nets

By Jim Duffy

Santa Clara, Calif.

Bay Networks, Inc. will roll out a series of enhancements to its System 5000 switch over the next 18 months designed to allow users to significantly scale frame- and cell-based backbones.

New hardware will feature higher density modules and higher speed backplanes. At the same time, the enhancements will help pave the way for Bay's new Gigabit Ethernet backbone offerings, the result of its recent acquisition of Rapid-City Communications (NW, June 23, page 1).

Bay is positioning its Rapid-City Gigabit Ethernet switches as a network center aggregator of System 5000s deployed in wiring closets. Eighty percent of System 5000s are going into wiring closets,

ets, with the remainder anchoring campus backbones, Bay officials said. System 5000s also will get Gigabit Ethernet modules to, at some point, connect to the

Rapid-City switch.

As for System 5000, Bay is working on a next-generation ATM backplane for the box

See Bay, page 60

SYSTEM 5000 ENHANCEMENTS

- 30G bit/sec ATM backplane will provide a fourfold increase in ATM bandwidth.
- 24G bit/sec frame-based backplane will increase frame bandwidths by 8G bit/sec.
- T-1/E-1 circuit emulation will enable users to attach voice network gear.
- DS-3/E-3 WAN modules will enable users to build ATM metropolitan-area networks.

The Decency Act is dead



By Ellen Messmer

Washington, D.C.

The U.S. Supreme Court last week struck down the Communications Decency Act (CDA), a law that would have forced network managers to police their networks for "indecent" content or risk criminal liability.

Because of the court's ruling in favor of free speech, managers

will not have to take extraordinary measures to monitor content on their network — at least for now. However, the Clinton administration, which fought for the CDA and lost, now wants the

See CDA, page 60

president of Bell Consulting, Inc. in Cupertino, Calif. "We've known for a while that it doesn't make sense at the desktop. Now we're starting to realize that the merits of ATM in the enterprise are also dubious."

Customers such as Joseph Giroux are leaning away from ATM and toward Gigabit Ethernet for the backbone.

"We're already using 100M bit/sec Ethernet, so I'm thinking

See ATM, page 59

Start-up aims massive router squarely at the enterprise

By Jim Duffy

Landover, Md.

While Cisco Systems, Inc. and other companies are aiming their new high-speed routers at service providers, a start-up is looking to help end users relieve the strain on their IP-based corporate networks.

Start-up Torrent Networking Technologies is developing high-speed routers to add zip to IP

nets and prepare them for the new Web-based millennium. While Cisco is targeting its upcoming Gigabit Switch Router (GSR) at Internet service providers, Torrent is eyeing companies looking to scale their Cisco 7500 networks.

Torrent will offer a super-high-speed IP backbone that can be laid over existing 7500 nets,

See Torrent, page 59

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NetworkWorld

Fusion





**THERE WAS,
IN FACT,
A REASON
THEY CALLED IT
THE PERSONAL
COMPUTER.**



Oh yeah. There's a person sitting in front of it.

Oftentimes, that person is a very special person called an employee. Someone who walks through your doors in the morning and back out in the evening (sometimes, very late in the evening). Someone who will rewrite paragraphs in the shower. Or not. Someone who will work through lunch to make something just right. Or not. Someone who will care. Or not.

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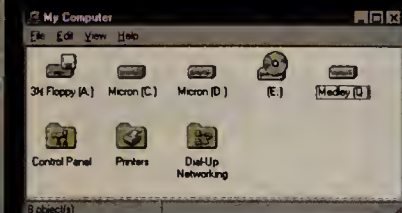
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MANGOSOFT BEARS FRUIT



The start-up's Medley software lets users set up virtual drives across a net. Page 17.

PEERING INTO E-MAIL'S FUTURE

Peer-to-peer software like DropChute+ can get around traditional e-mail's shortcomings. Page 10.



CISCO SHOPS AGAIN

The internetwork giant shells out \$200 million for two more acquisitions. Page 16.

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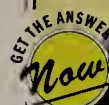
Be a NET KNOW-IT-ALL

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This week's question:

What do NetSys, TGV Software and Combinet have in common?



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This Week

Only on Fusion

Backlog. Cabletron says it's been unable to keep up with demand for the high-end SmartSwitch 6000. This has resulted in a backlog and lost sales. The network giant also says it's been stung by slow sales overseas. **DocFinder: 2723**

Webware. Software firms pushed a flurry of new Web applications at PC Expo in New York this month. **DocFinder: 2724**

Patent suit. Digital and Intel are reportedly thinking about settling the lawsuit alleging that Intel copied Digital's semiconductor technology. The fight has gotten nasty. **DocFinder: 2725**

Interview. Corel Corp. brought WordPerfect back from near death after buying it from Novell. Now Corel is betting on network computers. Check out an interview with CEO Michael Cowpland. **DocFinder: 2726**

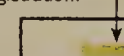
From the front page:

Router. Read our Page 1 story on Torrent's high-speed routers, then look up articles on other attempts to ease network bottlenecks. **DocFinder: 2720**

ATM. After reading our story, go online for ATM primers, user case studies and reviews — not to mention info on Gigabit Ethernet and other competing technologies. **DocFinder: 2718**

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Compact Devices' Twister Web server brings files to the Web quickly and easily.

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News briefs, June 30, 1997

Cisco to pump up Catalyst 5000

■ Cisco Systems, Inc. later this year will unveil a Gigabit Switching road map for its Catalyst 5000 family of LAN switches. In that vein, the company will announce new 12G bit/sec ATM modules for the Catalyst 5000.

The company also plans to roll out OC-12 modules for the Catalyst 5000 in four to five months, said Marthin de Beer, product-line manager for Cisco's high-end switching family. Cisco also will ship a Route Switch processor for the Catalyst 5000 "very shortly," but will not ship Netflow daughter cards for the Catalyst 5000 line until early next year, de Beer said.

CompuServe, by more than a nose

■ Despite its poor showing on Wall Street, CompuServe, Inc.'s Internet backbone received top honors last week. Keynote Systems, an independent company that tests Internet performance, released results from a recent study of 29 Internet service provider backbones throughout the U.S.

TOP ISP BACKBONE PERFORMERS

Time it took Keynote to access and download a 50K-byte file from each ISP's Web page over a dedicated T-1, (1.544M bit/sec) line:

- 1 CompuServe → 1.54 seconds
- 2 GridNet → 2.95 seconds
- 3 AGIS → 3.27 seconds
- 4 UUNET → 3.47 seconds
- 5 Savvis → 4.27 seconds

each provider's Web page over a dedicated T-1 (1.544M bit/sec) connection from April 20 to May 20. The tests took place 24 hours a day from 27 major metropolitan areas.

Regulators just say 'no' to SBC, Ameritech

■ The Federal Communications Commission last week rejected an application by SBC Communications, Inc. to enter the long-distance market in Oklahoma. The move came a day after the Department of Justice recommended that the FCC reject Ameritech Corp.'s bid to enter the long-distance market in Michigan.

The regulators said the regional Bell operating companies had not yet proven the existence of sufficient local competition. The RBOCs said that is because long-distance carriers are deliberately staying out of the local market.

PCS bidders threaten feds with a rubber check

■ The wireless C-block personal communication services (PCS) license winners were whining again last week about not being able to pay the government the billions of dollars they owe. NextWave Telecom, Inc., the highest C-block bidder, owes the government \$4.2 billion.

The group of wireless PCS companies are banding together and telling the FCC and the federal government that they have to restructure payment plans.

If the government does not work with the group, they are threatening to default on their respective payments. In April, the FCC put a hold on the C- and F-block PCS license payments that were due (NW, April 7, page 6). Now the group wants the government to work with them further, possibly delaying payments for eight years.

Wireless LANs defined

■ The IEEE last week finalized the 802.11 standard, which defines how multivendor wireless LAN products will interoperate. The standard defines a transmission rate of up to 2M bit/sec over infrared or radio frequency bands.

The standard also includes the media access control protocol Carrier Sense Multiple Access with collision avoidance, which means devices implementing the standard can interoperate with wired Ethernet LANs. The IEEE has been working on 802.11 since 1990.

Compaq riding NT's wave with Tandem merger

Company targets huge, high-volume server market with \$3 billion purchase.

By John Cox and Kristi Essick
Houston, Texas

You can see the future of Windows NT in Compaq Computer Corp.'s acquisition of Tandem Computers, Inc.: large-scale, low-cost NT servers that can handle high-volume transactions and armies of users.

The \$3 billion deal is Compaq's response to the fast-growing market for servers running Windows NT and the limited size of those servers today.

With Tandem's ServerNet clustering software, which Compaq licenses today, Compaq will better be able to yoke Intel processors to create large-scale processing platforms for NT applications.

In addition, Tandem's parallel-processing Unix servers, with database, transaction-processing and middleware software, will let Compaq deliver machines for the huge transaction applications that are likely to emerge on the Internet.

"We need this [kind of technology]," said Sheldon Laube, chief technology officer at USWeb Corp., a Santa Clara, Calif.-based Internet service provider. "We have customers with a requirement for high-performance machines."

"The Compaq ProLiant server only goes up to four processors, but the Tandem systems go considerably beyond that. I'll be waiting to see the details, but from the outside, the merger makes a lot of sense," Laube said.

On the surface, analysts agreed Compaq/Tandem looks like a perfect marriage because there is little product overlap. Tandem is best known for its Himalaya line of clustered, parallel-processing Unix servers and for the database- and transaction-processing software that runs on them.

ServerNet is software that interconnects processors, memory and communications and

links them all directly to high-bandwidth network connections.

By contrast, Compaq has been focused on PC LAN servers based on Intel processors. As part of its move to support larger scale PC servers, Compaq licensed ServerNet a year ago from Tandem.

Tandem, in turn, has been looking to expand the market for its software technologies by moving into the high-volume PC server business.

But integrating Tandem's high-end Unix software and Compaq's lower end Windows

Now Tandem most likely will stop selling these servers, and Compaq will probably replace them with its own ServerNet-enhanced NT boxes, Josselyn said.

On the opposite end of the scale, Tandem adds high-end, massively parallel systems to Compaq's range of servers and desktops for the enterprise, said Lorraine Cosgrove, research manager at IDC.

Compaq has centered its scalability strategy on grouping Intel processors into robust NT-based PC servers, while Tandem has concentrated on porting Server-

WHAT COMPAQ'S BUYOUT OF TANDEM MEANS**Benefits:**

- ▲ Tandem's ServerNet software, ported to NT, will let Compaq customers cluster NT servers for big performance gains.
- ▲ A broader range of servers gives customers a growth path for critical NT applications.
- ▲ Customers can buy the companies' full range of servers from one source.
- ▲ Compaq can offer Tandem's high-end Unix servers and software for large-scale, critical transaction applications.

Drawbacks:

- ▼ Integrating NT and Unix product lines may be difficult.
- ▼ Different corporate cultures could disrupt a smooth merger.
- ▼ Compaq will have to learn how to support users with large-scale, 24-hour transaction applications.

NT-based servers could be tricky, and the differing corporate cultures could be an obstacle, analysts said.

"Tandem has an unassuming, low-profile approach to large accounts," said Cedric Thomas, president of Frontier Associates, a Paris-based consulting firm. "Compaq has a high-volume approach through distributors, and they [Compaq] have the reputation of being arrogant."

Both companies have been working closely with Microsoft Corp. to ensure a growth path for NT. In fact, Microsoft hired Tandem to rewrite key parts of ServerNet for Windows NT; the ServerNet technology is an essential part of Microsoft's Wolfpack NT clustering technology.

Tandem has its own line of two-, four- and 16-way Pentium Pro processor-based NT servers but has had to sign up manufacturers to make the boxes, according to Steve Josselyn, an analyst at International Data Corp., (IDC) a market research company in Framingham, Mass.

Net clustering technology and other software from its high-end, parallel-processing Himalaya line of Unix servers to NT, she said.

However, combining the two somewhat disparate technologies will not be easy, says Eric Woods, analyst at London-based Ovum, Ltd.

"It will be a challenge to deliver that level of integration," he said.

Mergers of this size often have cultural and strategic problems as well, he added.

Essick is a correspondent with the IDG News Service in London.



Go online for:

- Analysts' reaction to the Compaq/Tandem deal
- Financials for both companies
- Previous stories about the duo

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CORRECTIONS

A story last week about Atreve Software (NW, June 23, page 39) incorrectly stated that the company was founded by former executives from Open Horizon, Inc. The founders were from Open Environment Corp.

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Netscape scripting language wins ECMA standard approval

By Carol Sliwa

An international standards body last week did the expected and announced its formal acceptance of a new Internet scripting language based on Netscape Communications Corp.'s JavaScript specification.

The standard scripting language was dubbed ECMA-262, or ECMAScript, which plays off the name of the European Computer Manufacturers Association standards body that accepted it. Netscape's implementation of the standard still will be called JavaScript.

Plans call for ECMA to seek International Standards Organization approval for ECMA-262.

JavaScript is designed for tying together application pieces to form more powerful or useful Web applications. Netscape late last year submitted JavaScript to ECMA for consideration as a standard.

An ECMA working group that also included representatives from Sun Microsystems, Inc., Borland International, Inc. and even Microsoft Corp., quickly agreed on a core specification and ironed out a variety of minor issues over the next six months.

Compass reading

In other Netscape news, the company soon will formally announce the new Compass server-side technology it previewed earlier this month at its Developer Conference.

Compass is designed to help users organize and filter the flood of information — including Web content, e-mail or newsgroup postings — coming at them from the Internet and corporate intranets.

Users can specify when and how they want to receive the information. ■

Microsoft steals page from Marimba book

By Carol Sliwa
Redmond, Wash.

Microsoft Corp. now plans to push much more than content.

The Internet convert last week unveiled its "package management" software designed to move applications, or updates, out to end users' desktops. The software will ship with the new Java Virtual Machine in its Internet Explorer 4.0 browser, the company said.

With Java applications growing larger, package management would help solve the problem of long download times, said Microsoft group program manager Charles Fitzgerald. An application could be automatically downloaded when the computer is not in use and stored locally.

Microsoft's proposed standard for pushing out Web content to end users, the Channel Definition Format (CDF), can be used to help distribute applications, according to Fitzgerald. CDF describes how and when

information will be automatically delivered to desktops.

"Because [package management] uses CDF as the transport mechanism, you don't have to go out and buy expensive servers. You can actually deploy these things on any existing Web server," Fitzgerald said.

According to Fitzgerald, package management allows users to build a single push mechanism for delivering everything from software applications to ActiveX controls, HTML, scripts, Java applets and Java class libraries, which are the blocks of prebuilt code that help programmers write applications.

Heavy marketing

The company has no plans to turn package management into a product or put a heavy marketing push behind it, according to Microsoft Internet Marketing Director Yusuf Mehdi.

But, at an Internet Explorer Reviewers Workshop held last week, Microsoft did position package management against a competing application push mechanism from its arch rival, Netscape Communications Corp. Netscape is bundling tech-

nology from Marimba, Inc. with the Netcaster push component of its Communicator browser/groupware client.

Marimba's Castanet tuner can deploy, install and update Java and non-Java applications on any platform over the 'Net.

"[Castanet] requires a proprietary protocol on the wire," Fitzgerald claimed. "It requires a fairly expensive server... What we've been able to do is piggyback the Java delivery on the whole CDF infrastructure."

Although Microsoft claims package management will be made available with Internet Explorer 4.0 on other operating systems,

Marimba questioned the cross-platform capabilities of Microsoft's offering.

"The reality is this is a Microsoft-only capability, and no customer today is Microsoft and only Microsoft," said David Cope, Marimba's vice president of marketing.

Package management is due out in July with the Internet Explorer 4.0 beta on Windows 95 and Windows NT. The final version is scheduled to ship by year-end. ■

Microsoft adds feature-packed IIS

By Carol Sliwa
Redmond, Wash.

Microsoft Corp. has packed a whopping 63M bytes of features into the new Internet Information Server (IIS) Version 4.0, which last week entered its first public beta.

That is roughly 50M bytes more than IIS 3.0, if a full installation is done, according to Microsoft product manager Jonathan Perera.

The Microsoft Management Console, Transaction Server 2.0, Certificate Server 1.0 and a debugger for creating Active Server Pages are just a few of the many new features jammed into the product.

Bundled with Microsoft's NT Server, the feature-packed IIS 4.0 would appear to be a logical consideration for NT customers. But competitors will still find an opening, according to Tom Harris, a research director with International Data Corp. in Framingham, Mass.

"Netscape, Oracle and IBM have the advantage of products that are cross-platform. Now they'll have to match functionality and ease of use to counter this new substantial offering from Microsoft," Harris said.

Putting together transaction systems traditionally has been an

expensive and time-consuming undertaking. But having a transaction processor integrated with the operating system, plus the tools necessary to develop the applications, will reduce development time, thus saving companies money, Harris said.

MICROSOFT'S INTERNET INFORMATION SERVER 4.0

New features include:

Administration

- Microsoft Management Console
- Enhanced browser-based management
- Bandwidth throttling
- Wizards for Web site creation

Application services

- Integration with Microsoft Transaction Server 2.0
- Crash protection
- Active Server Pages Debugger

Security

- Certificate Server 1.0
- Ability to map certificates to Windows NT directory

With more customers moving toward component-based applications, Microsoft has realized the need for a transaction server to manage the interaction of the components and help protect

against crashes, Perera said. If one application crashes, IIS will stay up and running and restart the application, Perera said.

In addition to Web-based application services, IIS also offers administrators improved management capabilities.

The Microsoft Management Console lets them manage multiple servers, save server settings and personalize the server functions they want to monitor.

Users also can manage the Web server or individual Web sites from any standard Web browser that supports frames and the new standardized version of JavaScript.

Wizards are available to help administrators create a virtual directory to indicate where content will be stored, assign IP addresses, set up security settings for the site and set privileges.

Another IIS 4.0 feature lets administrators manage the bandwidth allocated to each Web site, if there are multiple Web sites running on a single machine.

In the area of security, Microsoft has included a certificate server that will issue X.509 digital certificates to Web browsers and a way to map the certificates to the Windows NT Directory.

Another IIS 4.0 beta is scheduled for the fall, before the final release at the end of the year, Perera said. ■

Exchange Server features put to customer beta test

By Paul McNamara
Redmond, Wash.

Microsoft Corp. last week provided key partners and developers with a limited beta version of the next Exchange Server upgrade, code-named Osmium.

Osmium will include event-scripting capabilities for building simple workflows, plus an improved mechanism for recovering deleted messages.

As previously disclosed, Microsoft also will add a much larger message store — going from 16G bytes to multiterabytes — to address a persistent source of complaints from users.

Microsoft also has added support for Internet Message Access Protocol 4 on the server and Outlook client.

The new event-scripting feature will augment existing rules-setting capabilities within Exchange 5.0, said Rob Shurtleff, lead product manager for Exchange.

Event scripting will let users set triggers, such as the time of

day a script should run, he said.

"What we chose to do instead of building our own scripting environment was to allow you to use any scripting environment you want," such as Perl or C++, Shurtleff said. "What this does from a programming standpoint is allow IT groups, consultants or end users to use any tool they're familiar with to create scripts."

As for message recovery, Exchange 5.0 already has that capability, but it is designed for worst-case scenarios and requires a lot of work on the part of network administrators.

Osmium will allow managers to set a window of time, say 30 days, during which deleted messages will appear hidden from the user but remain available in a queue. If needed, they can be recovered by the administrator or a trained end user.

Microsoft hopes to issue a full production-quality beta within one to three months, Shurtleff said. Microsoft expects to ship a final version by year-end. ■

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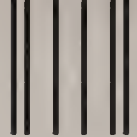
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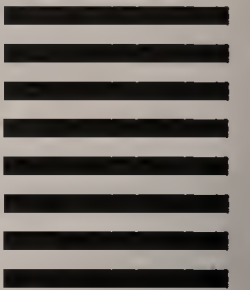
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Peer-to-peer takes on store-and-forward e-mail

By Paul McNamara

A new breed of peer-to-peer software is emerging that could help users sidestep some of e-mail's more worrisome pitfalls — Internet bottlenecks, garbled file attachments and inadequate security.

These client-side products in development provide instant messaging, secure "me-to-you" file transfers and updates about which group members are online without the uncertainties associated with server-based, store-and-forward e-mail.

"These products are looking to supplement, not replace, e-mail," said Mark Levitt, an analyst with International Data Corp. of Framingham, Mass. Users will include short-term project teams, manufacturers and their suppliers, attorneys and their clients or anyone else who wants more immediate and secure messaging than traditional e-mail can provide.

However, one drawback to the new products is that they require customers to run the same proprietary software on each client.

Designed for use on LANs and WANs, examples of the genre in beta or heading there are:

- **DropChute+** from Hilgraeve, Inc., of Monroe, Mich., which touts drag-and-drop simplicity for unsophisticated end users; point-to-point file transfer over leased lines or dial-up Internet connections; and a feature that allows one user to connect to another over the 'Net even if the second party is offline.

- **Java-based Ding** from Activerse, Inc., of Austin, Texas, which allows Windows 95 and NT users to tell at a glance whether group members are online and available to exchange messages, URLs and files in real time over a direct TCP/IP connection.

- **ICQ** ("I seek you") from Mirabilis, an Israeli start-up company, and Instant Messenger, a service from America Online Networks, while targeted toward home consumers, will offer similar functions that the companies say will be useful in business settings.

"All you need is to have client software on each end. You don't need a server, you don't need any other infrastructure other than the Web," he said.

The added security and speed come from using an open peer-to-peer IP connection, rather than e-mail's often circuitous routing through multiple servers and gateways. Any one of these routing methods may cause delays or offer a snoop an opportunity to examine someone's important file.

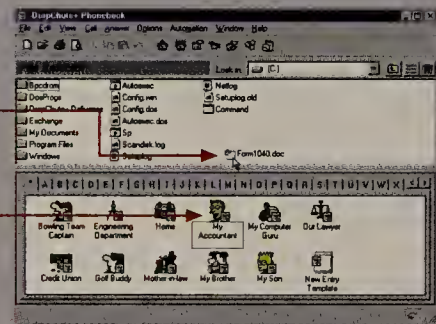
Simplicity is what appeals to Eric Maxwell, network administrator at Visionary Telecom, Inc.,

Using DropChute+ Phonebook

Hilgraeve's DropChute+ software is among a number of emerging messaging products that uses peer-to-peer file transfer.

The sender selects a file to be transferred to another DropChute+ user and drags it into the lower window.

The file is dropped on a customizable icon representing the recipient and DropChute+ makes the transfer automatically.



These products remain untested and are not intended for enterprisewide deployment, but potential customers and industry experts are enthusiastic about their potential.

"[They are] addressing the need for sending information securely and instantaneously with confirmation to someone who isn't on your network," Levitt said.

of Santa Ana, Calif.

Maxwell has signed up for a beta test of DropChute+, which runs on Windows 95 and Windows NT.

"We do a lot of real sensitive file transfers," Maxwell said. "[DropChute+] will increase our security greatly and also will open up new realms as far as distribution, both in the sending and receiving of files." ■

Oracle8 gets NC spin

By John Cox
New York

What Oracle Corp. promoted as the unveiling of Oracle8 ended up more as a showcase for the Java-based network computers (NC) that are so near and dear to the heart of Oracle CEO Larry Ellison.

Ellison demonstrated on-stage here at Radio City Music Hall a range of new features in the Oracle8 database management system, such as the capacity to store 10 times the data and support 10 times the users as the previous version. The advances are of such a magnitude that Ellison is positioning Oracle8 as the database for managing all of a company's Internet data and transactions in the future.

Also on display was a new feature for using Oracle as an e-mail repository. Company officials said Oracle8 could handle tens of thousands of e-mail users, balancing the load over multiple processors and using its transaction processing features to ensure integrity and delivery of the messages.

But the primary focus of what should have been a database announcement — underscored by a thumping soundtrack, special effects, an appearance by retired Gen. Colin Powell and repeated verbal jabs at Microsoft Corp.'s Bill Gates — was NCs.

Near the start of his talk, Ellison single-handedly removed an NC server from a box, an NC client from another box, plugged in various power and network connections and started loading

the NC server software. "I'm really doing this," he assured the audience. "You don't see Bill Gates installing hardware on stage, do you?"

Later in the demonstration, he switched on the NC, typed in a password and was able to access Java applets. In addition, through a new software connection called NC Connect for Windows, he accessed Windows applications running on a server. "A fifth-grade teacher could set this up," he said.

Ellison revealed that Network Computer, Inc. (NCI) will be offering — through Propeller Portable Computer Products, Inc. (www.propellerinc.com) — Network in a Box, a package of five NCs, NC Server and all the requisite software for \$4,995. The package is designed to let corporations quickly set up a pilot NC system to test. The system will be available in mid-July.

There were two NC-related announcements timed for the Oracle8 launch. In one, NCI and its partners, including IBM and Sun Microsystems, Inc., unveiled an initial specification for mobile network computers (see story, page 35).

In the second announcement, Schlumberger Smart Cards of North America, of Morristown, N.J., said it will manufacture credit card-sized smart cards for the NCI-based NCs. Smart cards are a secure way to let users log on to a system and gain access to their applications and data. ■

ISDN customers fight back

User-driven database to track carriers' foibles.

By Tim Greene
San Francisco

ISDN users are mad as hell. Armed with a new database, hopefully they won't have to take it anymore.

The California ISDN Users Group (CIUG) is looking into setting up a Web site to collect installation data — time to install, failure to show up when scheduled, lines not installed properly the first time — that can be used to prod carriers to perform better. A decision could come as early as this week.

If the database is fed by enough users, it will reveal which carriers are doing a good job and

pinpoint trouble spots within a single carrier's service area, said Bob Larribeau, CIUG's director.

Then users — even the little guys — can go to the phone companies and demand better service. For instance, small customers that lack the clout of large corporations could enlist the help of state regulators. Armed with the kind of information in the database, they could ask public utilities commissions (PUC) to take official action to bring deficient carriers in line.

"It would be useful to get a consumer perspective on a phone company and whether it's fulfilling its tariff," said Terry

Bote, a Colorado PUC spokesman.

Larribeau admitted the database would be selective and those with horror stories might file the most. It would be difficult to verify the accuracy of the filings, he acknowledged.

The database idea sprang from the experience of Jeff Freeth, transmission manager at Hewlett-Packard Co. While setting up HP's telecommuting program, Freeth ran into repeated installation problems. He tracked the lines ordered, numbering more than 3,200 in the U.S., and was able to demonstrate to carriers that they were missing their promised performance levels.

Now HP gets free installation from Pacific Bell if the carrier fails to acknowledge an order

within 48 hours, misses an agreed-upon appointment (arriving early or late) or fails to give 48-hour notification to change an appointment. The carrier adds three months' free service if it fails to show up for an appointment or if installation takes more than one visit.

The individual Pacific Bell department responsible for the problem pays the penalty. "The pain of cutting that check is very, very important. It changes the mindset of the people within the [phone company]," Freeth said.

Larribeau is working this week to set up the Web site, but money

could become an issue. "We're a shoestring operation," he said. ■

EASIER TELECOMMUTING

Actions to take when setting up a telecommuter program:

- Host a Web site where users can place their order for telecommuting gear and services.
- Update users about the status of their requests until the requests are fulfilled.
- To reduce configuration errors, build tools that perform automatic configurations.
- Establish an electronic ordering system with your carriers.
- Give users detailed instructions about how to set up the equipment in their homes.
- Standardize a platform to minimize the body of knowledge the help desk needs.
- Consider outsourcing.

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In tangled tale, Cisco snares Ardent

Cascade founder Wu Fu Chen joins Cisco in \$156 million stock swap for net access firm.

By Jim Duffy
San Jose, Calif.

Cisco Systems, Inc.'s \$156 million acquisition last week of network access product start-up Ardent Communications Corp. might seem like just another in a string of purchases by the inter-network giant, but there is a story behind this story.

Cisco was actually one of Ardent's original investors, providing the company with \$8 million of its initial \$12 million in funding.

Cisco's investment was a show of faith in Ardent CEO Wu Fu Chen, who founded Cascade

Communications Corp. as well as Arris Networks, Inc., a company acquired by Cascade.

Ardent currently is building low-cost network access gear for funneling compressed voice, video and data onto frame relay and ATM lines.

Originally, the plan was for Ardent to build xDSL-based network access technology, with Cisco having the option to buy the technology or the company.

But that deal fell through, and Cisco assumed xDSL development of its own based on technology obtained via Cisco's

recent acquisition of Telesend, Inc.

"There were some internal political Cisco developments, I guess," Chen said when asked why the xDSL arrangement was scrapped.

Cisco said it came down to timing. "We sort of had a change of heart," said Alex Mendez, vice president and general manager of Cisco's Multiservice Access business unit. "Voice/data integration is an area that's growing very rapidly. We're right in the sweet spot of the market."

There also were reports that the deal fizzled because Chen riled up Cisco by trying to recruit its employees to join him at Ardent.

Mendez could not confirm this. "I'd heard different versions of that," he said.

Mendez said Ardent's products will complement Cisco's re-

cently announced 3800 line of multiservice access gear by providing a lower cost offering for smaller branch office and regional sites.

"We've never been good at having low-cost products," he said. "Wu Fu's heritage is in low-cost, high-density stuff."

Pricing for the 3800 starts at \$5,000, while the Ardent products will start around \$3,700, he said.

Ardent's 40 employees will be absorbed by Cisco's Multiservice Access business unit.

Cisco's shopping list did not stop at Ardent last week. Cisco also signed an agreement to acquire Global Internet Software Group, a developer of Windows NT-based network security software, for about \$40 million.


Global Internet Software Group is a wholly owned subsidiary of Palo Alto, Calif.-based Global

Internet.Com, Inc., a provider of network security products and services.

Cisco also has purchased an undisclosed minority stake in Global Internet.Com. ■

Cisco's latest acquisitions

PROFILE: ARDENT COMMUNICATIONS CORP.

Based: San Jose, Calif. 

Products: Low-cost, high-density network access gear

Management: Wu Fu Chen, founder and CEO (formerly with Cascade and Arris)

Funding: Cisco, Sequoia, Chen and others

Employees: 40

PROFILE: GLOBAL INTERNET SOFTWARE GROUP

Based: San Mateo, Calif. 

Product: Centri Security Manager, a Windows NT firewall

Management: Mark Kriss, president (formerly with Global Village Communication); Scott Wiegel, vice president of engineering (formerly with Blue Ridge Software)

Subsidiary of: Global Internet.Com

Sun: My Java is faster than yours

By Ellen Messmer
Mountain View, Calif.

Sun Microsystems, Inc. last week went on the offensive against Microsoft Corp. by claiming that Solaris with Sun's Java Virtual Machine (JVM) runs far faster than NT 4.0 with Microsoft's Java equivalent.

According to benchmark tests released by Sun, Solaris with Sun's Java Development Kit (JDK) 1.1 is from 1 1/2 to 7 times faster than NT 4.0 with Microsoft's Software Developer's Kit 1.5 when running Java applications.

However, some Java users said their own real-world experiences do not reflect these results, and their main concern is that competition between Microsoft and Sun leads to ever-better Java performance. Applications written in Java are typically at least twice as slow as applications written in C or other languages.

Microsoft product manager Cornellius Willis responded that Sun's benchmarks "do not represent an apples-to-apples" comparison. Willis scathingly noted that Sun's advice for making Java faster is to "run it on overpriced workstations like SPARC" when cheaper NT boxes will do.

Joe Keller, SunSoft director of marketing, said Sun is publicizing the three benchmark tests—one of which, called CaffeineMark, was done independently by Pendragon Software, Inc.—because some in the industry, including Microsoft, have claimed that Solaris is

slower than NT for running Java.

Dismayed by the sniping between the two industry giants, some users have their own perspective on the matter.

PrideCom Productions, a San Francisco-based provider of a Java-based chat service on the Internet for the gay community, has more than 15,000 users making connections each day, sometimes reaching 700 simultaneously.

PrideCom, which uses the Volano chat server, last year had the service running on a SPARC machine using the earlier version of Sun's JVM in the JDK 1.02 (see story, page 40).

As the chat service grew more popular, PrideCom found that thread-handling on Solaris was inadequate, creating time delays for chat users.

"A thread is an element of work on the operating system, and we created three elements of work for each user logging in," said Jeffrey Mainville, vice president of technology at PrideCom. But the threading was slow, and chat users were complaining that they were experiencing 15-second time delays.

Mainville said he tried running the JDK 1.1 on Solaris when it came out this February, but it still seemed like a "lag monster." It was so important to increase the Java speed, PrideCom got hold of the beta for Microsoft's new JVM, called SDK 2.0, to try it out on an NT box. "It increased capacity fourfold, and performance is no longer an issue," Mainville said. ■

Video distribution tops list of IP Multicasting uses

By Chris Nerney

Video distribution is the most popular use for IP Multicasting in corporate enterprises, according to the first in-depth survey of network professionals currently employing the technology.

The survey of more than 100 IT managers shows that almost two-thirds of them use IP Multicasting for distributing video/audio and Web content, with collaboration and conferencing being the next most popular use (see graphic). The study was commissioned by the IP Multicast Initiative (IPMI), an industry consortium that is mounting an educational and lobbying effort to hasten deployment of the technology.

IP Multicasting proponents say the technology is ideal for multi-media applications because it saves on bandwidth. Multicasting involves the sending of a single data stream to multiple recipients rather than sending the data to each recipi-

ent via a point-to-point data stream.

The survey also highlighted obstacles to IP Multicasting adoption. Nearly 60% of survey respondents cited concerns about the impact that widespread use of the technology would have on their networks.

software supporting IP Multicast.

However, Virginia Brooks, an analyst with Aberdeen Group, Inc. in Boston, said such concerns "are what you'd expect to see with any new technology."

A broad range of businesses and organizations today are employing IP Multicast, said Brian Hill of Collaborative Research, the Los Altos, Calif.-based research firm that conducted the survey.

"Enterprises ranging from major financial exchange centers and telecommunications firms to smaller educational facilities and information kiosk companies are all currently using IP Multicasting in production environments," Hill said.

The study concluded that the major factors affecting the spread of IP Multicasting are the continued growth of intranets, the need to distribute "high-value financial information," the willingness of Internet service providers to support the technology and the continued development of content, especially multimedia.

The 1997 Report on IP Multicast Usage is available free to IPMI members. Starting July 11, non-members can purchase the report from Stardust for \$1,475. ■

IP MULTICAST USAGE

The most popular uses of IP Multicast, according to a survey of IT professionals:



Based on over 100 respondents, more than one response allowed.

SOURCE: COLLABORATIVE RESEARCH, LOS ALTOS, CALIF.

"There's lots of confusion," said Martin Hall, chief technology officer of Stardust Technologies, Inc., the Campbell, Calif.-based vendor that leads the IPMI. "People are asking, 'If I turn on IP Multicast, will that flood my network?'"

An equal number of respondents cited a lack of application



“Gee, Frank.

*Maybe you should take
the rest of the day off.”*



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Second, Exchange Server is a remarkably flexible and easy-to-administer system:

- It supports all current Internet standards and protocols and it works with all major network environments. Plus, its open architecture means you'll be ready for whatever curve-ball technology might come your way in the future.
- The tight integration of Exchange with Windows NT® Server lets you reap the benefits of advanced security features and helpful management tools like the performance monitor and event log.
- Centralized administration lets you, the person who does the hard part, configure Internet gateways, add and delete users, track messages and even reboot—using one friendly interface on a single machine.
- Automated Exchange System Attendants even watch over your server and connection status, responding to problems by restarting the server or notifying you—before you get the bothersome phone calls.
- Also included—a hassle-free setup that won't increase your odds of becoming a hair-loss candidate.

Play QUAKE—without the annoying interruptions.

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Microsoft Exchange Server gives you the best of both worlds: a stable and streamlined messaging and collaboration system that fervently embraces the open standards of the Internet. As a proud member of the Microsoft BackOffice® family, Exchange Server is just one of the integrated server products that can be customized to solve tons of your frustrating business problems. To learn more about what Microsoft Exchange Server has to offer, and to get a free evaluation copy, please visit our Web site.

NSF backs plan to sell IP numbers

By Todd Wallack

The National Science Foundation (NSF) has approved a plan to establish a nonprofit agency to assign IP numbers in the Americas and parts of Africa, federal officials announced last week.

The American Registry for Internet Numbers (ARIN), modeled after the Asia-Pacific Network Information Center and the Reseau Internet Protocol European, would dole out blocks of IP numbers to major Internet service providers. The ISPs

would, in turn, pass along smaller chunks to customers, including other ISPs and users.

For the first time, however, ISPs and users would have to pay for the numbers.

Currently, Network Solutions, Inc. (NSI) handles IP number registrations for free

under a cooperative agreement with the NSF. But the agreement is scheduled to expire in March 1998, and NSI and the NSF want to get out of the IP number registration business.

IP NAME-SELLING GAME

Under the ARIN plan, a block of 8,192 IP numbers would cost \$2,500, or 31 cents each. A block of 262,144 would cost \$20,000, or 8 cents each.

"This move is another step by the federal government in the continuing privatization and commercialization of the Internet," said George Strawn, director of the NSF's Networking and Communications Research and Infrastructure division.

Eventually, Strawn said, similar organizations also

will be created to handle IP registrations in Africa and South America. Until then, ARIN will oversee assignments for those areas, just as NSI does today.

Strawn said the agency wanted to act now, nine months before NSI's agreement ends, to give ARIN organizers time to set

up the agency and gradually take on registration duties.

It is unclear how much users will wind up paying for the IP numbers because each ISP must decide whether to pass along the additional cost. In addition, users only would have to pay for new, not existing, IP numbers.

According to the ARIN Web site, about 300 ISPs and large users have received blocks of numbers from NSI over the past year and would pay an average of \$5,000 under the proposed fee schedule.

ARIN said it needs the fees to fund its estimated \$3 million annual budget. Organizers also plan to charge members \$1,000 a year to participate in ARIN meetings and vote on proposals.

A portion of the fees may also be used to fund Jon Postel and his Internet Assigned Numbers Authority (IANA), which oversees Internet addresses around the world. Since the Department of Defense stopped funding IANA earlier this year, IP registries have been kicking in dollars.

NSF spokeswoman Beth Gaston said hundreds of people participated in drafting the ARIN proposal, and there has been no major opposition.

Indeed, PSINet, Inc. officials, who have been outspoken critics of the Internet Society plan for new domain names, said they believe the ARIN proposal is "good news for the Internet."

"IP numbers are a scarce resource that has traditionally been managed by the Internet community," said Tony Kelly, PSINet's director of corporate

marketing. "The ARIN proposal simply codifies [that]."

But the Association of Online Professionals (AOP), an Alexandria, Va.-based trade association that represents ISPs, online services and other Internet-related businesses — including PSINet — claims many of its members oppose the proposal because of its ambiguity and lack of accountability.

"It's beyond vague," said David McClure, AOP's executive director. "As it exists today, it has no mission. It has no bylaws. It has no budget. It is nothing but a price list . . . and a group of self-perpetuating boards of trustees."

For now, NSI will continue to handle IP numbers under its agreement with the NSF.

The IDG News Service contributed to this report.

Netscape and Concentric unite to offer intranet hosting services

By Denise Pappalardo and Rebecca Sykes

Netscape Communications Corp. and Concentric Network Corp. last week agreed to offer hosted private intranet services accessible from anywhere on the Internet.

The services will give any person or business with Internet access the ability to create a "virtual office," which can be shared by coworkers or other authorized users, according to Mike Homer, senior vice president of marketing at Netscape.

The services will be available through a new section of Netscape's Internet site and will be called Netscape Virtual Office by Concentric, officials said. Concentric, a Cupertino, Calif.-based Internet service provider, will host and manage the Netscape Communicator and SuiteSpot application servers upon which the virtual offices will be based.

SuiteSpot lets users publish their private Web pages and supports messaging and groupware applications. Communicator lets users set up Web-based e-mail systems, Web-based chat

groups and easy content update features. Netscape Navigator is included to access the Virtual Office site.

Billing and customer service support will come from Concentric, said Hank Nothhaft, president and CEO of Concentric.

Concentric earlier this month rolled out its version of services targeted toward the same market as the new Virtual Office service. ConcentricHost is an Internet access, Web hosting service that includes e-mail accounts, an Internet domain name and Web-based management software (NW, June 9, page 35).

Nothhaft said Concentric's new ConcentricHost service will be melded into the Virtual Office service. Existing ConcentricHost customers will be migrated over to Virtual Office, he said.

Pricing is expected to range between \$29.95 and \$99.95 per month, with additional per-user charges. Firm pricing will not be available until August when the service is slated for availability.

Sykes is a correspondent for IDG News Service.

Start-up's service dodges 'Net sales tax

By Ellen Messmer
Nashua, N.H.

New Hampshire is more than just a pretty place for a Web start-up. It also is a place that will not charge outsourcer Internet Commerce Services Corp. (ICOMS) sales tax, allowing the company to pass those savings on to you.

The company last week announced an order-fulfillment outsourcing service for Web merchants that takes the sales burden — and the sales taxes — off a user's shoulders.

ICOMS, as it wants to be known, provides a wide range of back-end credit card and electronic processing in the form of MerchantTrax, a service based on the Open Market, Inc. transaction server, OM-Transact. By outsourcing this processing, the merchant does not have to make the hefty investment in back-office equipment and personnel, but instead agrees to pay ICOMS a percentage of the sales, typically 2%.

"The cost of doing this independently is very high, anywhere from \$100,000 to \$250,000 and up," said Mildene Bradley, information services manager at Houghton-Mifflin Co. For more than a year, Houghton-Mifflin has operated an educational service at greatsource.com and sold books at HMI.net.com.

Houghton-Mifflin wrote its own storefront software and maintains its Web server in-house. However it has handed

credit-card and order-generation processing to ICOMS because the publishing house is reluctant to invest more while Web commerce remains economically unproven.

Closed for business

Until recently, Houghton-Mifflin relied on similar order-processing services from Open Market. However, Open Market last month abandoned the ser-

manager. "Some states, like Massachusetts for one, are claiming [sales tax] on the 'Net if the order is being processed in their state. Only four states have said they will not claim if the order is processed electronically in the state — California, New Hampshire, Oregon and Rhode Island."

New Hampshire appears to be the only state to have officially made it a law.

PROFILE: INTERNET COMMERCE SERVICES CORP.

Based:	Nashua, N.H.
Founded:	January 1997
Management:	Cliff Conneighton, CEO and cofounder (formerly with BBN and Lotus); David Toub, president and cofounder (formerly with BBN and Digital); Michael Gero, vice president of service operations (formerly with BBN)
Service offered:	MerchantTrax, a secure and reliable Internet transaction-processing service
Financials:	Privately funded

vices market, saying it would stick to its core business — software.

"We're sticking to software," was all Bob Weinberger, Open Market vice president of marketing, was willing to say about the company bailing out of the services market.

Because the server processing is done in New Hampshire, a state with no sales tax, ICOMS' clientele will face no revenue demands from state taxing authorities for whatever sales ICOMS handles. "The sales tax question is very confused," said Cliff Conneighton, ICOMS CEO and former BBN Corp. general

ICOMS will process credit cards over the 'Net through leased lines to third-party card processors. It also will, if the Web merchant requires, calculate the logistics of the order by calculating sales tax and shipping and convert that information into formats such as electronic data interchange.

ICOMS is asking merchants for 2% of the value of the goods, which averages out to about \$1 per transaction, Conneighton said.

"There is a minimum charge of 25 cents and a maximum of \$4," he said. ■

Local Networks

Covering: LAN Hubs, Switches, and Management • Operating Systems • Servers

Briefs

■ Milpitas, Calif.-based **Adaptec, Inc.** last week announced software that allows customers to use existing **Fast Ethernet adapters** to achieve gigabit performance. The **Duralink Port Aggregation** software — which runs on Adaptec PCI adapters — aggregates the bandwidth of standard 100M bit/sec Ethernet



adapter ports into a virtual, single-network port to provide multiple gigabit-per-second data transfer rates. As many as 32 Fast Ethernet ports can be grouped for a maximum of 3.2G bit/sec total throughput. The software is priced at \$199 and will ship in August.

© Adaptec: (408) 945-8600

■ **Standard Microsystems Corp.** last week rolled out a new **Ethernet switch** designed for small workgroups. The **Tiger-Switch 8** provides eight Ethernet ports and two Fast Ethernet uplinks and supports as many as 8,192 media access control addresses.

The TigerSwitch 8 is priced at \$1,500 and is available now.

© SMC: (516) 273-3100

■ San Jose, Calif.-based **IX-MICRO**, formerly Integrated Micro Solutions, Inc., last week announced **25M and 155M bit/sec ATM network interface cards**. The **Gale Force Lightning ATM PCI** adapters allow a computer or server running MacOS to communicate with computers, file servers, printers and other devices connected to an ATM network.

Pricing for the 25M bit/sec adapter starts at \$399. Pricing for the 155M bit/sec card starts at \$699. Both are available now.

Start-up MangoSoft nurtures new net architecture

Company's Medley software blends PC drives into one huge virtual disk for sharing of files and applications.

By Doug Barney
Westborough, Mass.

If you believe Steve Frank, his company has created a third way to build a LAN. Forget peer-to-peer and client/server. MangoSoft Corp. wants you to think CacheLink Networking.

The new technology is based on some pretty common stan-

“Now there is a third way to network,” Frank said.

Many LAN users are accustomed to sharing a drive, but this is usually on a separate server. Medley is different in that the shared drive it creates is actually an amalgam of client drives.

Instead of taking a fixed portion of each drive, Medley adapts to patterns of use.

For instance, an underused PC would devote more of its drive to storing files, particularly for backup. On the other hand, frequently used files would tend to be stored on the drives of the machines that access them.

Files would ebb and flow as usage changes, a feature MangoSoft President Frank calls “adaptive.”

Medley also uses idle RAM to cache files and speed performance, Frank said.

Networking for dummies

For now, MangoSoft is aiming Medley at outfits that have no LANs, including remote offices

without a dedicated IS staff. Once the software gains a foothold, MangoSoft plans to pitch Medley to the enterprise, where the company claims the software eventually will be able to handle thousands of nodes.

While Medley is designed for a simple peer-to-peer configuration, it also can work with a Windows NT server or workstation. In this instance, the software will store copies of files on the server, treating it as a large hard drive.

Frank claims Medley is not just simple, but fault-tolerant as well. Because the virtual drive is really multiple drives, backup copies of files can be maintained and kept synchronized by Medley.

Smart guys, too?

While not initially designed for real network professionals, the concept has piqued interest. “There might be some real possibilities. I have never heard of anything like that,” said Edwin Wilk, information systems manager for WHDH-TV in Boston.

Wilk was particularly interested in the software's ability to distribute files from physical

drive to drive, but was curious about how well the system operated when not all machines were turned on.

Medley, which sells for about \$200 per seat, is in beta test and will ship in August.

Frank, a cofounder of Kendall Square Research, has raised \$18 million in private funding for MangoSoft.

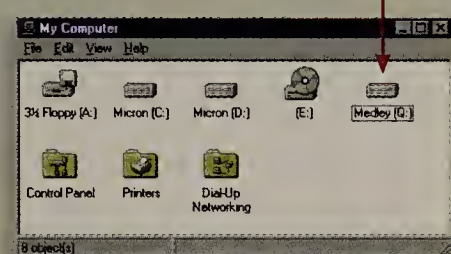
And just in case you were wondering, the name “Mango” has no special meaning. “We wanted a friendly name, and the domain name was available,” Frank said.

The 70-person strong company also boasts a well-connected vice president of development in Keith Allchin, the brother of Microsoft Corp. NT guru Jim Allchin.

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dards, namely Ethernet, TCP/IP and Windows. An organization weaves its PCs together via Ethernet in a peer-to-peer fashion and loads MangoSoft Medley software on each desktop machine. The result is a new virtual drive that all end users can share for data files and applications.

Invincible adds SPARC to servers

Company ditches Digital Unix platform in favor of Sun's.

By Sandra Gittlen
Medway, Mass.

Moving away from its Digital Equipment Corp. technology roots, Invincible Technologies Corp. last week introduced a server line based on Sun Microsystems, Inc.'s SPARC hardware and Solaris software.

Invincible's new Lifeline 2000 servers, powered by one to four 300-MHz UltraSPARC processors and featuring Java-based management tools, are designed for use as application-specific machines running Network File System, Web, database management or other software.

Previously, Invincible's servers were based solely on Digital's Alpha processors and Digital's

version of Unix. “[But] the appeal of the Digital solution was much less than we had hoped,” said Ken Kutzer, product line manager for the Lifeline 2000.

Invincible will continue selling its existing Alpha-based machines and support customers of those systems, but the company has no plans to add new Alpha-based models, Kutzer said.

Like existing Invincible servers, the Lifeline 2000 line features full component redun-

dancy. The company also has introduced SFTnet software, which enables the servers to monitor themselves for potential failures and hand off processing chores from one processor to another in case of a failure. In addition, the servers can balance loads across I/O ports.

A new Web browser-based management program — the Java-based Management, Environmental and Diagnostic Subsystem — allows for remote access and multisite monitoring by

net administrators. Invincible said it is looking into a partnership with Netscape Communications Corp. to further develop

“The appeal of the Digital solution was much less than we had hoped,” says Ken Kutzer of Invincible

Webservices for the servers.

The servers have 128M to 4G bytes of memory, with 512K to 1M bytes of secondary cache. The disk capacity is 28G bytes to 1 terabyte.

The servers also are upgradable to Fibre Channel technology, which provides for better large file transfer performance and allows for more CPU subsystems and storage.

In addition, it enables the building of reliable networks across campuses, Kutzer said. “With Fibre Channel, if a CPU goes out in Building 1, the workload can be transferred to the CPU in Building 3,” he said.

The Lifeline 2000, which ships this month, costs \$23,500 for a one 167-MHz processor server with 128M bytes of memory. The Lifeline 2000 SFT costs \$113,660 and ships in August.

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How can NCs compete with this?

Oracle's Larry Ellison and the rest of you network computer (NC) backers better watch out.

Here comes Microsoft again. The company earlier this month took part in the long-awaited NetPC rollout

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event. Microsoft also announced a ship date for the Windows NT Zero Administration Kit (ZAK), updated the Windows Terminal and introduced J/Direct, new hardware access controls for Java developers.

The NetPC essentially is the old, diskless PC recycled with more RAM, better video support and a hard disk. What it gives up are a floppy disk, CD-ROM drive and other means for the user to introduce unknown and unwanted software.

The Windows Terminal is Microsoft's version of X Windows. Under the Windows Terminal model, applications execute on a Windows NT server with display and input handled by what amounts to a dumb terminal.

ZAK purports to deliver on the promise that all administration of the Windows desktop and its underlying hardware can be centralized to ease the burden of the network and PC administrator.

It's a very necessary component if corporate customers are to embrace NetPCs and Windows Terminals. ZAK for NT should be shipping by the time you read this.

J/Direct is a new initiative to provide Java programmers with better access to the underlying hardware on the Wintel-based machine on which their application is running.

The upshot of these announcements, provided everything is delivered as promised, is Microsoft has ensured that NCs will pose little challenge to the Wintel systems installed across so many corporate networks.



Dave Kearns

At the same time, Microsoft has co-opted the best of the NC's operating environment.

Microsoft figures you will run ZAK in existing PC networks, then replace those desktop machines with NetPCs according to your normal upgrade cycle.

In Microsoft's ideal scenario, customers will also swap out dumb terminals, now used by data entry clerks, with Windows Terminals that will give end users access to any new Java applications developed for the NC market as well as all familiar Win-

dows applications.

With J/Direct, these machines should be running better Java applications than NCs.

All in all, it looks like another win for Bill Gates and another bloody nose for Larry Ellison.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

Network administrators may like end users to have password-enabled screen savers. But these screen savers can be irritating if the administrator needs to work on the end user's PC when the end user isn't around to plug in the password. Birch Grove Software (www.bgrove.com/bgrove) has a product that overcomes this problem for NetWare and VINES networks. Its Screen Pass software works with any screen saver video file for Windows.

3Com and Cabletron show growth, but Cabletron results disappoint

Cabletron attributes earnings shortfall to switch shortage.

By Sari Kalin and Kristi Essick

3Com Corp. last week reported increased earnings and revenue for the quarter ended May 31, while rival Cabletron Systems, Inc. reported revenue growth but only slight improvement in earnings for the first quarter.

3Com posted revenue of \$829.9 million for its fourth quarter of the fiscal year, a 26% increase over the \$660.2 million it posted in the comparable quarter the year before.

Earnings rose 8% to \$89.2 million in the fourth quarter compared to last year's fourth-quarter earnings of \$82.5 million. Company officials said the revenue and earnings growth was driven by sales of LAN and WAN products.

Separately, Cabletron's earnings of \$58.8 million for the first quarter were below company expectations in that they

grew only slightly from the \$57.1 million reported in last year's first quarter.

Revenue climbed to \$362.7 million for the quarter, a 12% rise over revenue in last year's first quarter.

Cabletron attributed the less-than-stellar results to several factors.

First, the company was unable to produce enough SmartSwitch 6000 high-end switches to meet demand, which resulted in a backlog of orders and some lost sales opportunities.

At the same time, demand for the company's MMAC shared media product declined more than expected.

The company also said European sales were substantially below target.

Kalin is an IDG News Service correspondent in Boston. Essick is a correspondent in the London bureau.

Internetworks

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Briefs

■ **Cisco Systems, Inc.** last week rolled out **new capabilities for its 3600 series dial access server** in an effort to transform the product into a multifunction access platform. The enhancements include high-density asynchronous dial



modules, Fast Ethernet LAN connectivity, high-density Ethernet and serial connections. The features let users deploy the 3600 as a high-density dial aggregator and router. The 3600 now can house 16- and 32-port asynchronous dial modules, a fourfold increase over current models.

The 3600 also can now sport a single Fast Ethernet pipe for high-speed server links and four-port Ethernet modules for aggregating multiple LAN segments. The product now supports four-port T-1/E-1 serial WAN links. The asynchronous cards, available in July, will cost \$2,600 for the 16-port configuration and \$4,600 for 32 ports. The Fast Ethernet, Ethernet and serial cards, available now, cost \$3,000, \$4,000 and \$4,600, respectively. The compression module and redundant power supply also will be available in July and cost \$3,000 and \$2,200, respectively.

■ **Big Island Communications, Inc.** last week introduced its **YoYo Pro PCI card with call management software**. The software lets users of BRI ISDN services control calling features from Macintosh or IBM-compatible PCs. Rather than dialing long strings of numbers to control features such as paging and caller ID, YoYo supports them with mouse clicks on a GUI. The software logs calls and sorts incoming calls based on caller ID to let some through and divert others to voice mail. The YoYo card costs \$499 and will be available by the end of summer.

IP address mgmt. vendors look to link LDAP with DHCP

By Jim Duffy

IP address-management companies are looking at linking a standard directory access protocol with address servers in an effort to ease the management of large TCP/IP environments.

Later this year, companies such as Smallworks, Inc., Competitive Automation, Inc., Novell, Inc. and Cisco Systems, Inc. separately will unveil software products that combine Lightweight Directory Access Protocol (LDAP) with Dynamic Host Configuration Protocol (DHCP) servers. This will enable users to build redundancy, security and name-to-address synchronization into their address-management environments, among other benefits, vendors said.

LDAP is a standard for accessing network directory services. DHCP is a protocol for dynamically allocating IP addresses to users so they can access network resources.

Vendors say linking the two technologies will help solve some big TCP/IP address management issues, including the inability of DHCP servers to share address information, align address allocation with security policy and coordinate naming operations among multiple directories.

"People recognize how ideal LDAP is for something like this," said Jim Thompson, chief technology officer at SmallWorks of Austin, Texas.

See LDAP, page 24

ADDRESSING DEMAND

Vendor plans for melding Lightweight Directory Access Protocol (LDAP) and Dynamic Host Configuration Protocol (DHCP).

Company	Activity	Product delivery
Competitive Automation	Working with SmallWorks to replicate DHCP servers using LDAP	End of year
Novell	Using LDAP to share DHCP data between Novell Directory Services and Domain Name System directories for managing global directories	In development
Cisco	Working with Microsoft to propose LDAP as a standard for server replication; looking at LDAP as a method for resolving names in disparate directories	Undecided
Quadritek	Evaluating LDAP as an integrated network services protocol	Statement of direction later this summer
American Internet	Deploying LDAP to link DHCP and security servers	End of year

ANALYSIS

ISDN: Does it spell packets?

By Tim Greene

ISDN isn't just for providing circuit-switched services any more.

Users and vendors are pushing to take ISDN's packet capability beyond its current level and use it to support packet-switched data over larger ISDN bearer or B channels. Those logical channels could be used to establish individual Internet/intranet connections for users who want a way to send and receive low-bandwidth data without the time and expense of setting up and tearing down ISDN bearerlinks.

The idea is to expand the potential packet bandwidth from 9.6K bit/sec on an ISDN signaling — or D channel — to 64K bit/sec on the ISDN bearer — or B channel. With it, users could establish higher bandwidth packet connections than they could over the signaling channel. It also would let them support as many as 127 logical channels on a single 64K bit/sec ISDN B channel. The only device they would need to deploy this service would be a packet assembler/disassembler.

While B-channel packet is an ISDN feature supported by

phone company switches, it is not widely used. But that could change with the recent focus on D-channel packet.

ISDN offers two different channels, B and D. D is a packet channel used primarily for signaling to set up circuit-switched B-channel calls traditionally used for voice or data traffic.

While the technology could be useful, it is costly. For example, unlimited use of a B channel for packet data from Pacific Bell in California costs \$150 per month. However, carriers are encouraging D-channel packet by switching from a per-packet fee to a flat monthly fee. They could do the same for the price of B-channel packet, Fritz said.

Don Norman, a product manager for Pacific Bell's ISDN service said he did not know of such plans from the company.

By encouraging B-channel packet use, phone companies could get data traffic off their voice nets. Rather than tying up voice switches, which are used to establish circuit-switched ISDN connections, carriers could drop B-channel data calls onto their packet nets, said Stan Kluz, telecom engineer for Lawrence Berkeley Laboratory. ■

PRIMER

D channel explained

ISDN has always had its own separate channel for signaling, but nobody paid much attention to it until the Internet and browser-based push technology came along to make it attractive.

Now carriers and equipment vendors are promoting the signaling channel, known as the D channel, as a way to set up a 9.6K bit/sec dedicated link from a customer to the 'Net with a new service to be called Always-On Dynamic ISDN (AO/DI) (NW, June 16, page 1).

While D-channel bandwidth is low, it is enough to handle e-mail, and it makes use of a connection that otherwise sits idle most of the time.

Basic Rate Interface ISDN is a dial-up service carried over the same type of wire as plain old telephone service, but POTS supports a single analog channel.

ISDN is digital and has two 64K bit/sec bearer channels — B channels — for carrying voice or data.

The D channel is different from ISDN B channels in that its bandwidth is only 16K bit/sec and is packet-based.

Each ISDN BRI line has a permanent connection between the customer's phone or PC and the telephone switch.

Signaling on a BRI D channel takes up only about 5K bit/sec of the available 16K bit/sec channel bandwidth.

The rest of the D-channel bandwidth can be used to send packet data to more than 200 separate destinations, and that is what is proposed by AO/DI.

Booting up a customer's ISDN-connected PC would establish a D-channel packet connection to an Internet service provider.

The ISP would use that X.25 connection to send the customer e-mail as it comes in.

— Tim Greene

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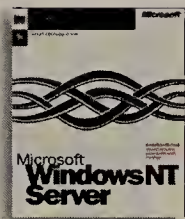
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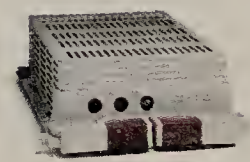
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LDAP

Continued from page 21

SmallWorks is working with DHCP server developer Competitive Automation of Menlo Park, Calif., to add LDAP to Competitive's Join software. LDAP will be used to replicate address information

across distributed DHCP servers.

"One of the problems in the DHCP community has been that the servers had to serve disparate address spaces," Thompson said. "You don't really get a lot of redundancy that way."

By using LDAP, two DHCP servers can immediately be informed that a third server has handed out an IP address,

he said.

LDAP can also be used to replicate Domain Name System (DNS) servers, Thompson said. That means name-to-address mappings and changes could be reflected almost instantaneously across distributed servers, he said.

Competitive will release LDAP-enabled DHCP server software by year-end,

said company President Laird McCulloch. It will be targeted at large enterprises and Internet service providers that need an "industrial-strength" server able to handle millions of addresses, he said.

Novell also is developing LDAP-enabled software that lets Novell Directory Services share DHCP configuration data with DNS and share in name- and address-tracking, said Tom Miller, senior development manager at Novell.

"[LDAP] allows us to offer a solution that provides global management capabilities rather than a server-centric configuration," Miller said. "You can manage the entire enterprises' IP address space from a single point."

Go online for:

- DHCP specs and a FAQ
- Other LDAP stories
- LDAP links

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Cisco is looking to LDAP as a way to handle naming in a network with different types of naming services, said John Strassner, chief architect in Cisco's Service Provider line of business.

"What we're trying to do with LDAP is have a seamless ability to resolve names," Strassner said.

Last March, Cisco and Microsoft Corp. coauthored a document drafting LDAP as a standard protocol for replicating data among name and address servers. This may help keep DHCP servers in sync and ease an administrator's management burden, Strassner said.

"If you have multiple DHCP servers on the same subnet and you have a PC coming up that wants to get an IP address, every DHCP server within hearing range is going to try and serve that request," Strassner said. "That's a problem."

Quadritek Systems, Inc. not only sees LDAP as a way to replicate name and address servers, but also as a protocol for bringing together an entire network service infrastructure. The company will announce a statement of direction on its LDAP/DHCP plans later this summer, said Alex Drescher, a Quadritek product manager.

American Internet Corp. views network security as a killer application for linking LDAP and DHCP. The firm will unveil a product before year-end, said Product Manager David Kaufman.

"The big problem with DHCP as a stand-alone protocol is that it tends to just give away access to our network," Kaufman said.

"It doesn't check who you are, it doesn't check what kinds of access rights you ought to have. It doesn't require any kind of registration. What we see happening is LDAP as the standard way to get at corporate user directory information and using that in the DHCP process in order to validate who the user is before handing out access to your network," he said. ■

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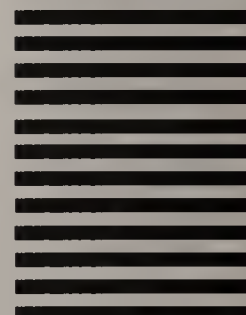
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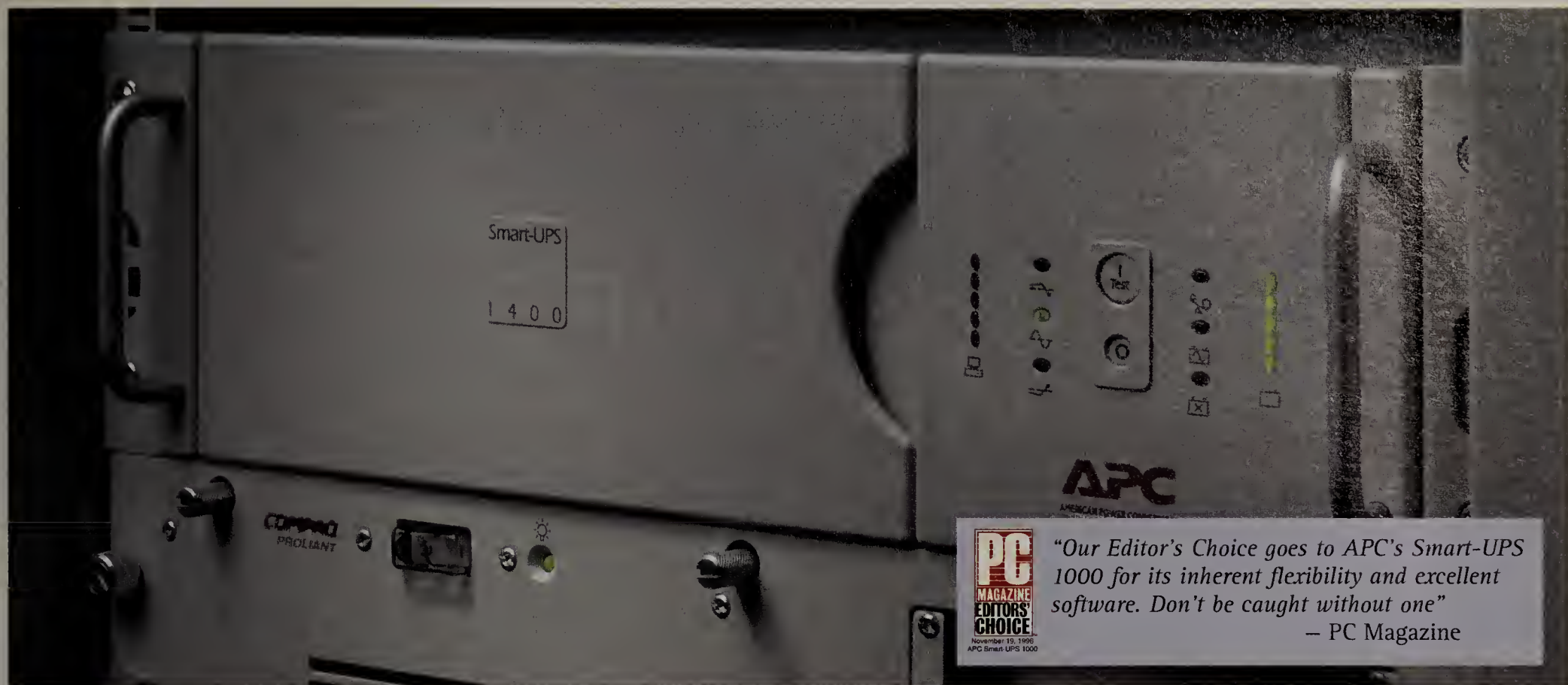
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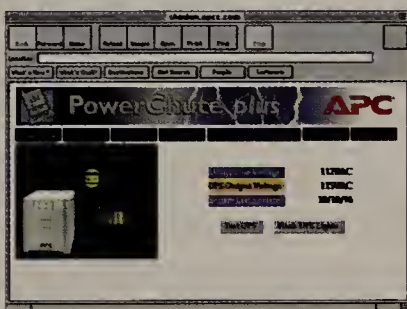
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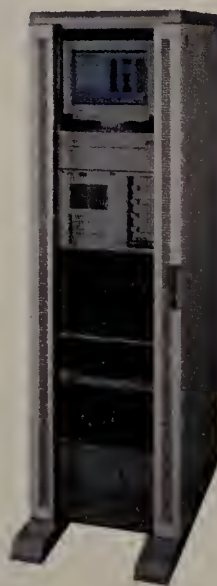
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Briefs

■ **Bell Atlantic Corp. and MCI Communication Corp. have signed a local interconnection agreement for Virginia, paving the way for MCI to offer local service in the state.**

Bell Atlantic has signed such agreements with 13 other potential competitors, though not with AT&T.

Bell Atlantic is still in the process of meeting the 14-point checklist that will allow the carrier to offer long-distance service.

■ **The Senate Commerce Committee knocked out a provision of the bipartisan proposal to balance the federal budget that would have authorized the FCC to auction toll-free vanity numbers.**

User attorney Greg Scott cautioned that the auction authority still could resurface when the full House and Senate vote on the federal budget.

That could happen especially if tax revenue and federal spending still do not add up.

■ **MCI Communications Corp. and SBC Communications, Inc. have sued the Federal Communications Commission over its recent order altering local access charges.**

SBC, the parent company of Pacific Bell, Nevada Bell and Southwestern Bell, said the FCC reduced per-minute access charges too much. MCI said the agency did not reduce them enough.

The charges are the fees paid by long-distance carriers to local carriers to originate and terminate calls on their local networks.

The FCC's reductions total \$1.7 billion the first year, but user groups have even labeled that level minimal because it is partially offset by new monthly per-line fees (NW, May 12, page 1).

Wireless service gives users high-speed 'Net link

By Denise Pappalardo

Warp Drive Networks, Inc. this week announced a wireless Internet access service that offers users an inexpensive, high-speed connection to the 'Net.

The company's Warp Access Service lets users download Web pages, graphics and text documents off the Internet at 128K bit/sec to T-1, or 1.544M bit/sec, for less than half the cost of a traditional dedicated private line.

For example, Warp Access users will pay \$500 per month for a wireless T-1 link compared with a telco-provisioned, dedicated T-1, which typically costs \$1,200 to \$1,500 per month.

The Warp Access service is designed to let small to midsize business users connect to the Internet through a dial-up or dedicated link from a traditional Internet service provider. The link is used to send outgoing traffic, such as e-mail or requests for Web pages. But instead of using a landline for downstream traffic, Warp Access sends return traffic over its unique UHF-based wireless network. The wireless pipe cuts recurring monthly costs associated with high-bandwidth, dedicated landline connections.

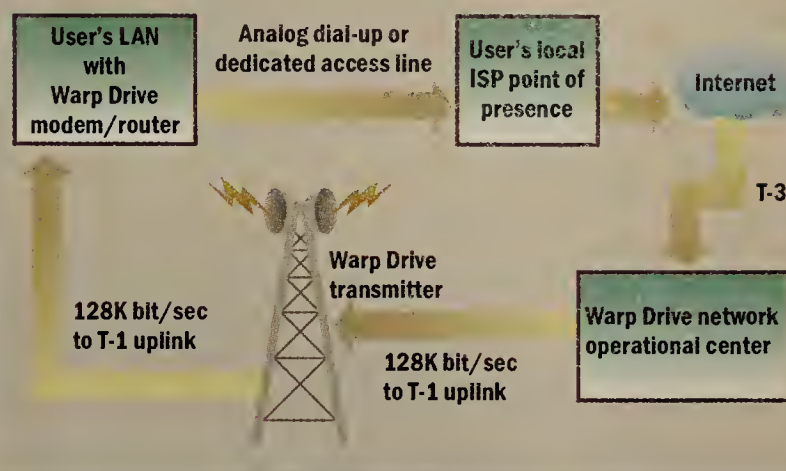
Warp Drive is the only wireless company that uses the UHF TV spectrum for Internet access services. The Federal Communications Commission granted the San Jose, Calif.-based company UHF licenses for the Silicon Valley region earlier this year. The UHF spectrum offers its license holders a secure, dedicated channel for communications.

The service offers users quick activation time, especially compared with dedicated service deployments. Because Warp Access provides links to the company's network operating center through a wireless connection, new customer accounts can be activated in one to two days, said Bruce Lichorowic, vice president of sales and marketing at Warp Drive. This quick turnaround is attractive to users who cannot wait four to eight weeks for a T-1 connection from a carrier.

Users like the quick turnaround Warp Drive's UHF wireless network offers. "The advantage of Warp Drive is you can deploy more bandwidth in two days than with any other carrier," said Mark DeFoyd, CEO at NetRocket Technologies, Inc., a Santa Clara, Calif., software inte-

HIGH-SPEED DOWNLOAD

Warp Drive users still need a landline upstream to the Internet but can use a simple analog dial-up connection or a dedicated access line to have information downloaded off the Internet at speeds of 128K bit/sec to 1.544M bit/sec (T-1).



grator. Warp Drive also uses Microwave Digital Signal (MDS) cellular technology in areas with rough terrain or where the carrier may not be able to secure a license, Lichorowic said.

Warp Drive is available in Seattle and the Silicon Valley. Service will be available in Los Angeles and Portland, Ore., by the end of the year. Warp Drive is negotiating a deal with a national ISP that will offer Warp Access service throughout the country,

but it would not name the ISP. The deal is expected to be announced in early July.

Warp Access 128K bit/sec dedicated service is \$150 per month; T-1, 1.544M bit/sec dedicated service is \$500 per month. Users are required to purchase a Warp Drive antenna and router. The antenna costs between \$25 to \$200 depending on the bandwidth chosen. A Warp Drive router ranges from \$395 for a single user to \$1,195 for 20 users. ■

Let's chat: UUNET adds discussion group support

By Denise Pappalardo

UUNET Technologies announced earlier this month that its Web hosting service users can now set up discussion groups and bulletin boards on their Web sites.

UUNET, a WorldCom, Inc. subsidiary, has deployed Expression chat servers from eShare Technologies, Inc. in Commack, N.Y., at its Web server farms. Now UUNET Web hosting customers can set up a chat group on their Web site that will support up to 25 Web surfers for \$125 per month.

For example, users can set up chat groups that are focused on specific topics

such as developing Java applications.

The eShare Expression 1.01 server is a Java-based Web chat server and threaded bulletin board system. Users who want to add chat groups to their Web site

as part of their Web hosting service can download the client software from one of UUNET's server sites. UUNET also lets its Web hosting customers add threaded bulletin boards to their Web sites at no additional cost.

Bulletin boards let users post notes to a central location where others can read them and add their own comments.

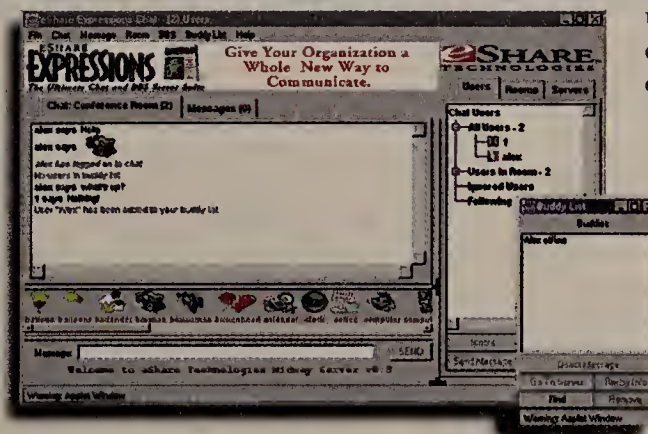
The eShare Expression chat and discussion server lets UUNET support multiple Web site chat groups simultaneously on a single server, said Paul Hoffman, manager of Web

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Users can set up chat groups using eShare's graphical user interface.

product marketing and development at UUNET. This eliminates the need for UUNET to deploy a separate server for each customer.

EShare's main competitor in this market is ichat, Inc., an Austin, Texas-based software company. Ichat's Rooms 3.0 chat server platform is based on HTML. Other Internet service providers such as ANS Communications, Inc. have already deployed ichat's platform. ■

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☐ 51-100 ☐ 251-500 ☐ 1001+

When do you plan to implement a remote access solution?
☐ immediately ☐ 1-3 months ☐ 7-12 months
☐ within 30 days ☐ 4-6 months ☐ 1+ year

How many employees at your site?
☐ 1-100 ☐ 251-500 ☐ 1001-5000
☐ 101-250 ☐ 501-1000 ☐ 5000+

How many remote sites/branch offices do you have?
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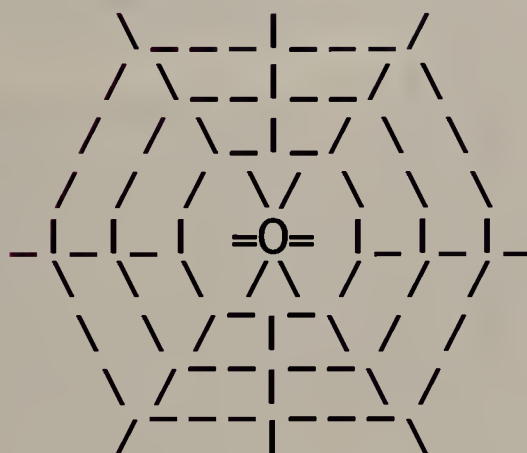


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WAN MONITOR

You've been warned: Get the details in writing

During contract negotiations, it can never hurt to get every little detail in writing. Nothing is too insignificant. Things have gotten so complicated

today that it is necessary to cover your back end for every possible contingency up front.

The problem is you are often dealing

with several different entities within a single carrier, and what you are told for one portion of the contract may not apply to the other. You never know what will turn

up down the road that could be critical to your application.

Case in point: We've recently gone through a round of negotiations on a contract for our voice and data services, and you'd be surprised at what we're getting in writing.

For example, we contracted with one carrier for the voice portion of our services, but it was contingent on the carrier delivering bills in specific formats — among other things — for our clients who ask for copies of expenses.

We quickly canceled that contract because the vendor delivered the bills on green bar paper, with no formatting.

They might as well have delivered them carved in a banana for all the good it did. While they could have done fancier laser printing and formatting, the bills could only be delivered weeks later — well after we have to bill our clients.

In signing with our next carrier, we had similar written considerations. We defined bill formats as a key deliverable, and documented the samples provided in an addendum to the contract.

One part we added to the data contract was an "out" clause for technology obsolescence.

We expect during the course of our contract to move our fax traffic to IP-based products, trimming substantial sums off our voice bill — but lowering our monthly contribution to the minimum commitments in the contract.

Should we fail to meet those commitments because of this technology change, we'll be hit with only a minimal penalty.

Also, we negotiated away all monthly and installation charges — not only for now, but for all future offices under this contract.

Anything and everything that was used to support the sales process we threw into the contract, providing us with documentation for any future problems.

The bottom line: Assume you are going to break the contract and figure out what you'll need to do that.

You need to think of every possible contingency while maximizing the opportunities to get out of the contract if the vendor doesn't deliver.

Your best ammunition will be lack of performance on their part, but that's hard to prove if you don't have everything in writing.

Briere is president and Heckart is director of broadband with Telechoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and heckart@telechoice.com.

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Intranet Applications

Covering: Messaging • Groupware • Databases •
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Briefs

■ **Despite the apparent success of AltaVista as one of the leading Internet search tools, Digital Equipment Corp. last week announced it has abandoned plans to take AltaVista Internet Software, Inc. public. Digital will roll AltaVista Internet software into its product division and offer the technology as part of Digital's overall product portfolio, according to Digital Chairman Robert Palmer.**

■ **Start-up Prompt Software, Inc., of Novato, Calif., tomorrow will unveil its first product, a "metasearch" software tool. WebSleuth is designed to simultaneously query multiple Internet search engines and index results based on content and context. Prompt is targeting WebSleuth toward workers in vertical markets such as education, government and retail. The software runs on Windows 95 and NT 4.0 and requires a Pentium CPU, 16M bytes of RAM and a 28.8K bit/sec modem.**

WebSleuth is available now for \$79.95 from the company's Web site (www.promptsoftware.com).
© Prompt: (415) 382 8840

■ **Lotus Development Corp., of Cambridge, Mass., last week began shipping Domino.Doc, the company's Web-based document management software that runs on its Domino server.**

The product allows users of Notes clients or Web browsers to capture, file, retrieve and distribute documents over the Internet. Domino.Doc costs \$4,275 for a single-processor server and \$12,825 for the multiprocessor version.

Notes clients and browser users can interact with Domino.Doc for no additional charge.

Browser users seeking optimum performance, however, may opt for an Open Document Management API integration component priced at \$29 per client.

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Network computer hits the road

Apple, IBM and others rally around new mobile thin-client specification.

By Elizabeth Heichler

Nearly a dozen vendors have agreed on a set of standards for mobile network computers (NC), a definition that will encompass devices ranging from smart cell phones to handheld computers.

Go online for:

- Full NC specs
- Previous articles on NCs and NetPCs
- Mobile computing links

www.nwfusion.com

The Mobile Network Computer Reference Specification is an extension of the Network Computer Reference Profile (NCRP) and will continue to evolve based on input from the

companies sponsoring it. The specification addresses how mobile NC screens will look, how much power they will consume and how they will be linked to networks and peripherals.

Using the spec, vendors will be able to build a new breed of Java-based thin clients to complement the desktop NCs that have already started to roll out from companies such as IBM. NCs are designed to give companies an alternative to Windows PCs that will be easier to manage.

Vendors agreeing to support the new specification are Apple Computer, Inc., Fujitsu, Ltd., Hitachi, Ltd., IBM and its Lotus Development Corp. subsidiary, Mitsubishi Electric Corp., Netscape Communications Corp., Nokia Mobile Phones, Oracle's Network Computer, Inc. (NCI),

Sun Microsystems, Inc., Toshiba Corp., Digital Equipment Corp., Matsushita, Psion, Ltd. and NEC Corp.

The specification, like the NCRP, is characterized by micro-processor and operating systems independence and is Java-centric, according to Phil Hester, vice president of development at IBM's NC division. However, the new spec aims to address the needs of mobile users by extending the space to address disconnected operations, data replication and consistency, lower network bandwidth, security and authentication, and power management, he said.

Three working groups have been formed to address the issues and define relevant APIs and reference implementations. Within 60 to 90 days, additional

details will be announced. As specific elements of the standard are developed, they will be turned over to the Open Group standards organization, Hester added.

Oracle subsidiary NCI has developed a persistent storage technology that will be used in mobile NCs, an NCI spokesman said. See Mobile, page 36

MOBILE NETWORK COMPUTER SPECIFICATIONS

- Smart card standards such as the Open Card Framework
- HTML and HTTP
- Support for teleconferencing using video or data
- Support for a variety of network attachments to LANs and WANs via wired or wireless connections
- Peripheral attachments such as Cardbus, Universal Serial Bus, serial and parallel ports, and infrared

The entire list of specifications can be found at www.ibm.com/nc.

Net.Genesis releases faster Web site analysis tool

By Chris Nerney

Cambridge, Mass.

Web site usage analysis vendor net.Genesis Corp. today released a new rev of its flagship product that officials claim processes data seven times faster than the previous one.

Along with a dramatic increase in speed, net.Analysis Pro UX 3.0 offers a more varied and a larger number of data reports compiled from Web server log files, said net.Genesis cofounder Matthew Cutler.

The new product also features an augmented browser interface for customizing reports and a separate HTML browser offering all desktop workers access to reports.

It is the second major release for net.Genesis in four months. In March, the company shipped net.Analysis 2.2 for Windows NT. Version 3.0 only runs on Sun Solaris 2.4 and 2.5 platforms, though an NT version is planned for later this summer.

While net.Analysis 2.2 takes 2 hours and 13 minutes to import a test log file, Version 3.0 imports it in less than 19 minutes, Cutler claimed.

The number and breadth of reports culled from Web site data also has been increased from the 27 offered in the earlier product, he said. Net.Analysis 3.0 breaks out data from some of those

PROFILE: NET.GENESIS CORP.

Founded: January 1994, by several MIT graduates

Based: Cambridge, Mass.

Finances: Funded by Bessemer Venture Partners and Charles River Ventures

Product: Net.Analysis Pro, a group of Web site usage and analysis software tools

Fun fact: In June 1995, net.Genesis founded the Webmasters' Guild (www.webmaster.org), a national professional organization for Web developers with chapters in more than a dozen cities and a membership of more than 4,000.

reports and adds some new ones for a total of 98 predefined reports with detailed information about Web site visitors.

Net.Analysis reports were designed to assist a number of corporate departments, Cutler said. For example, a report comparing Web site traffic originating from different search en-

gines could help a marketing executive decide where to place advertisements.

Network administrators could use reports to monitor the performance of the site, such as how long it takes for each Web page to download.

The new product also enables users to employ interactive analysis, according to Cutler.

"Users can double-click on relevant information that comes back in a report and then generate a number of subreports based on that," he said.

The browser-based Administrator Console provides site administrators full remote management capability, allowing them to import log files,

set filtering options and manage the Informix Software, Inc. database used by net.Analysis, Cutler said.

The release of net.Analysis 3.0 comes only a few months after Microsoft Corp.'s purchase of net.Genesis chief rival, Interse Corp., a move that raised fears in the site analysis market of a full-

fledged incursion by the software giant.

"Everybody in the site analysis space basically was holding their breath to see what would happen," said Ted Julian, a research analyst at International Data Corp. But Microsoft's decision to offer Interse software only as part of its SiteServer suite essentially has allowed net.Genesis and other site analysis vendors to dodge a bullet, he said.

Because of the large volume of data it processes, Cutler said, net.Analysis 3.0 runs on a separate hardware platform than the Web server. It supports a variety of Web server platforms from vendors such as Netscape Communications Corp., Microsoft, Lotus Development Corp. and Open Market, Inc.

Client reporting software is available for Windows 95 and NT.

Version 3.0 of net.Analysis Pro UX is available immediately for Solaris 2.4 and 2.5 and is priced at \$6,495. Each license includes the net.Analysis Engine and one net.Analysis Reporter client. Additional clients and the HTML Reporter are sold separately.

© net.Genesis: (617) 577-9800

Early users give NetPCs a thumbs-up

By John Cox

Two companies that have tested early versions of the just-announced NetPC say the new desktop systems are much easier to set up, troubleshoot and maintain than traditional Windows PCs.

As a result, Pennzoil Co. and Prudential HealthCare are planning large-scale tests when final versions of the NetPC become available in late summer or early fall. So far, each company has installed about 10 prototype NetPCs supplied by Intel Corp.

"We want to confirm the pricing model of just where and what are the cost savings, but from everything we've seen, NetPCs are a winner," said Britt Mayo, Pennzoil's director of information technology.

An alternative to Java-based network computers (NC), the NetPC is really nothing more than a Windows PC in a sealable case that lacks floppy disk and CD-ROM drives. But NetPCs also use new standard interfaces and protocols that make the devices easy to manage over a network. Using NetPCs, PC managers can

tailor a group of applications and data for one or a group of end users and download the configuration to the desktop. For end users, not much changes — the Windows operating system and applications still run locally.

Mayo thinks the NetPC can be used widely within Pennzoil given the company's highly standardized desktop configurations. So far, the company has used the devices in its MIS department.

Prudential HealthCare expects to run NetPCs in its customer service centers, but also is evaluating Java-based NCs for a range of server programs and downloadable applets that will owe nothing to Windows.

"We'll need to support different client environments," said Myles Trachtenberg, chief information officer for Prudential HealthCare, a subsidiary of The Prudential Life Insurance Co. of America, Roseland, N.J.

NetPCs' full promise is not expected to be realized until about mid-1998, when Microsoft Corp. plans to ship Windows NT 5.0 with some additions that are

part of Microsoft's Zero Administration Initiative. For example, the NT 5.0 Directory Service will store information about remote clients and send out Windows and applications updates.

For Pennzoil and Prudential HealthCare, controlling PC-related costs for thousands of desktop users is important.

Pennzoil strictly enforces a standard hardware and software configuration for desktop PCs. Mayo wanted to see if NetPCs would further reduce the company's hardware support costs, lower the cost of deploying software and streamline technical support for end users.

Managers found that if a problem occurred inside the NetPC's sealed case, the faulty box could simply be replaced with another, which a PC manager could activate and set up remotely. New or updated software was downloaded from a server.

Pennzoil's PC support group got fewer troubleshooting calls from users, and the problems they called about were easier to solve, Mayo said.

Just as importantly, there were no hidden costs.

Because of Pennzoil's highly standardized desktops, network traffic is very predictable, so changing to NetPCs had no impact on traffic, and no impact is expected when more are installed, Mayo said.

Prudential's Trachtenberg wanted greater control over what he calls end-to-end costs — the total dollar amount required to deliver the right applications and data to each employee.

"In the past, the PC was a personal productivity tool," he said. "Today, it has to be a true business computer — something to drive information out to our users." In other words, he said, it has to be something like a NetPC.

Prudential's PC managers found that NetPCs took half the time to set up compared to today's PCs.

Trachtenberg said the switch to NetPCs could affect network traffic, depending on the number of NetPCs per LAN segment, the bandwidth needs of initial software downloads and the per-

formance of applications during the day. All should be controllable using existing network management disciplines and tools, he said.

In the long run, Trachtenberg said managed PCs, like NetPCs, will create a much more predict-

WHAT USERS LIKE ABOUT NETPCS

Short-term benefits:

- ▶ Set-up time is half that of today's Windows PCs
- ▶ Applications and operating systems can be installed over a network using third-party software
- ▶ Fewer — and less difficult — problems reported to technical support

Long-term benefits:

- ▶ Will be able to centrally create, change and monitor a standard software environment for desktops
- ▶ Will be able to deploy applications to desktops faster and with fewer problems

able computing environment, which is essential in order to hold down costs.

"You will know how the pieces will integrate," he said. "You will know that when a change has occurred, it will work. [That's much better] than installing the software and trying later to figure out where it broke." ■

Microsoft and Netscape score encryption coup

OK to ship 128-bit technology to banks worldwide.

By Torsten Busse
San Francisco

Both Microsoft Corp. and Netscape Communications Corp. last week received permission from the U.S. government to export software that includes 128-bit encryption technology to banks worldwide for the protection of online financial transactions.

Specifically, Netscape received permission from the U.S. State Department to export its Communicator Web browser client software that features 128-bit encryption capabilities.

In addition, Netscape can now export its SuiteSpot server software using 128-bit encryption to certified banks worldwide, company executives said.

Microsoft got its go-ahead from the U.S. Department of Commerce. The company said it will incorporate 128-bit encryption in all domestic and export versions of Microsoft products that deal with the Internet,

beginning with Internet Explorer 4.0, Microsoft Money 98 and Internet Information Server.

Both companies use the Secure Sockets Layer protocol.

The government's export approval for 128-bit encryption does not require the use of key escrow — the storage of encryption keys to enable law enforcement officials to recover users' messages — but it does require a key recovery mechanism.

Under key recovery, a government-approved third party holds the keys to encrypted data, allowing the U.S. government to get access to encrypted data with proper court documents.

While Netscape is working with VeriSign, Inc. on key recovery, Microsoft said it will turn the certificate mechanism over to a reliable third-party group at the appropriate time.

Busse is a writer for the IDG News Service.

Mobile

Continued from page 35

woman said. NCI will provide details at a later date.

The initial NC specification implies that the device will be connected to a network. The mobile extension that permits devices to operate in disconnected mode is a necessary evolution, according to Eileen O'Brien, director of the network

computing service at International Data Corp. in Framingham, Mass.

"The NC will be a more robust product" as a result, O'Brien said.

The specification's strength vs. the competitive Windows CE specification from Microsoft Corp. is that the NC reference profile does not require a particular chip or operating system, whereas the CE devices will be geared toward a Windows envi-

ronment.

"The real winners here are the users because this gives them another choice for mobile and wireless computing," O'Brien said.

Microsoft was contacted by the vendors involved about the mobile NC initiative, but had not responded as of last Monday, IBM's Hester said.

Heichler is managing editor of IDG News Service in Boston.

NCD revs up more powerful network computers

Network Computing Devices, Inc. (NCD) will bump up the processing speeds of its network computing terminals in the third quarter, when the company releases its new range of Explora machines.

The Mountain View, Calif.-based firm is building its Explora 2 terminals around the 66-MHz PowerPC 403 microprocessor, according to Daniel Guilloux, president of NCD France. This is a jump over the 28-MHz and 33-MHz chips used in current versions of Explora.

One reason for increasing processor speeds is to let the Explora process Java applets more quickly, Guilloux said. In line with its predecessor, the Explora 2 will have no hard disk drive.

The three Explora 2 terminals will come with graphics chips offering resolutions as high as

1,600 by 1,200 pixels. The two most powerful models will have daughter cards offering MPEG video decompression.

By early 1998, NCD intends to start offering smart card readers with its Explora terminals.

For the moment, many companies are unwilling to pay the price of a smart card reader to provide authentication on a network, said Guilloux, who expects a more enthusiastic uptake of smart cards by corporate users when the price of the technology falls.

NCD, which has a three-year contract to build network stations for IBM also is in talks with Microsoft Corp. to build terminals according to the software company's Windows Terminal design, he added.

—Joanne Taaffe



'NET INSIDER

Talking can help

A few weeks ago, the formation of IOPS.ORG was announced (www.iops.org). Its initial members are ANS Communications, AT&T, BBN, EarthLink Network, GTE, MCI, Netcom, PSINet and UUNET. This is an organization that hopes to put deeds in front of pronouncements, as exemplified by the non-wordiness of its draft charter that, in its entirety, is:

IOPS.ORG promotes, in the public interest, industry cooperation on the joint engineering efforts to help ensure an operational, global Internet. It addresses issues that require coordination and information-sharing across and among Internet service providers, including:

1. Joint problem resolution
2. Technology assessment
3. Global Internet scaling and integrity

To accomplish its goals, IOPS.ORG supports engineering analysis, system simulation and testing and interaction with other groups and organizations as appropriate.

If you cannot quite figure out what they are up to from the draft charter, the press release says IOPS.ORG is "dedicated to making the commercial Internet more robust and reliable" and will do so by "addressing issues that require technical coordination and technical information-

sharing across and among ISPs." One example is explicitly having technical people at the ISPs communicate.

What a radical idea!

Technical communication for operations is not a new idea.

The Network Reliability Steering Committee does this in

the telephone business and there have been a number of Internet-related groups that have tried to do this in the past — for example, the Network Joint Management working

group in the Internet Engineering Task Force and the North American Network Operators Group.

One rather major difference between the other Internet efforts and IOPS.ORG is that IOPS.ORG is a dues-paying membership organization, and the members actually agree to do some work.

Previous efforts have been far more ad hoc.

The membership nature of IOPS.ORG presents significant benefits and some real challenges.

The biggest advantage is currently one of scale.

It is far easier to get real work done in an organization of less than a dozen members than in open meetings where there can

be more than a hundred attendees.

Another advantage is the commitment that has been made by the founding members to actually try to get some real work done.

There are a number of challenges created by the same small membership.

There are thousands of ISPs in the US.

Clearly, their specific interests cannot fully be met by a group with so few members, but their general interest is most importantly a viable Internet, and that can be fostered even by such a small group.

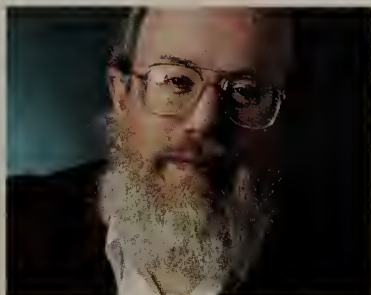
Some nonmembers may complain of nonrepresentation or antitrust collusion, and that is a shame, but it is part of what passes for self-interest in these times.

IOPS.ORG by itself will not magically make the Internet work perfectly for all purposes. Technical coordination cannot fix undercapitalization, arrogant cluelessness or oversubscribed data links.

What it can do is explore ways to add robustness to ISP interconnections and reduce the duration and impact of outages. Seems like a good idea to me.

Disclaimer: "Arrogant" and "clueless" clearly do not apply to Harvard, and anyway the above are my own opinions.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@harvard.edu.



Scott Bradner

Videoconferencing vendor moves well beyond ISDN

VideoServer embraces IP, frame relay and ATM nets.

By Paul McNamara
Burlington, Mass.

Best known for ISDN-based multipoint conferencing, VideoServer, Inc. last week released a road map for developing products that will allow videoconferencing over IP, frame relay and ATM networks.

Experts said the company needs to expand its product lineup to address growing interest in IP-based videoconferencing — fueled by product advances from Microsoft Corp. and Intel Corp. — as well as other high-speed videoconferencing options.

By year-end, VideoServer said it plans to introduce: a gateway that will link ISDN-based conferencing systems supporting the H.320 standard with IP systems supporting the newly adopted H.323 standard; an H.323-compliant multimedia conference server; and a gatekeeper that will allow IT managers to control multimedia traffic on their networks.

ATM angle

VideoServer last week also said it will work to bring more ATM users into multipoint videoconferences through an alliance with First Virtual Corp.

of Santa Clara, Calif.

The companies introduced an ATM card for VideoServer's H.320-based Series 2000 Multimedia Conference Server that

IN TWO YEARS, WILL YOU SUPPORT IP VIDEO?



Based on a survey of 50 large customers.

SOURCE: FORRESTER RESEARCH, CAMBRIDGE, MASS.

will allow ATM users to join multipoint videoconferences spanning several locations. The card is expected to ship in the fourth quarter and cost less than \$10,000.

These developments come on the heels of two announcements VideoServer made earlier this month.

First, the company said its gateways and multipoint servers will interoperate with a pair of Intel offerings: the TeamStation group videoconferencing system and Business Video Conferencing with ProShare Technology for desktop conferencing.

In addition, VideoServer and ABL Canada, Inc., of Montreal, announced their joint effort that will allow users to conference across frame relay networks.

Step in the right direction

One industry analyst, Andrew Davis of the Wainhouse Consulting Group in Brookline, Mass., said VideoServer is taking the right steps to ensure its continued prominence on the rapidly changing videoconferencing landscape.

"It's comforting to see that they realize there are going to be multiple networks and protocols, and they intend to be the glue holding all of this together," Davis said.

"The market they dominate today is going to be a small piece of a big market in the future," he said.

© VideoServer: (617) 229-2000

U2 Web site leaves fans singing the blues

By Carol Sliwa

"But I still haven't found what I'm looking for."

—U2

Webmasters might want to heed some of the problems encountered by fans of the rock band U2, who tried to access the band's "first official" Web site (<http://U2popmart.msn.com>), launched June 20.

The lesson seemed to be: It will not do you any good to build a fancy Internet or intranet site unless your target audience can get to it.

The Microsoft Network and U2 launched the Irish band's Web site with a one-hour live Webcast.

The site is designed to chronicle U2's worldwide PopMart

tour, which began on April 25 in Las Vegas.

The Web site promises hip, interactive tricks to anyone who downloads Microsoft NetShow as well as Shockwave and Real Player plug-ins. Downloading

these plug-ins "only takes a few minutes," the site promises. "Trust us, it will be worth it."

Well, many of U2's wired fans begged to differ — and those are the ones who could even access the site in the first place.

Many did not have the right equipment, and others had trouble with the downloads.

A sampling of their comments from "The Wire Archive, The Mailing List for U2 Fans" follows:

• "Mr. Gates — If you are truly the 'god' of the computer world, how can you do this to your children? Don't you love us?"

—Jan (who claimed to have gone through six

pots of coffee and three cartons of cigarettes trying to complete the downloads).

• "'Good graphics, loads fast, really interactive and fun.'" Hmm . . . Was that meant sarcastically? Granted, I don't have the fastest computer in the world, but it's certainly not the slowest, either. I felt like I was using a 286 last night."

—Mary (who finally accessed the site after "about six hours [of] trying")

Of course, if the site was easier to access, perhaps Microsoft Corp. and U2 would have received a few more messages like this:

• "I personally enjoy the site, even though I had to download the plug-ins. Ten minutes of download time is worth it. I promise you. I can't wait to see the band on tonight!"

—Brad



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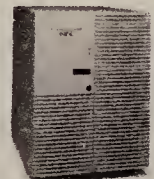
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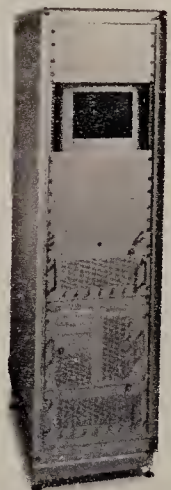
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Java development

Keeping up with the JDK

If you want to develop Java applets and applications for your company's network, don't blink. You might miss the latest changes Sun Microsystems, Inc. has made to its Java Development Kit (JDK).

Developers say keeping up with the changes Sun's JavaSoft unit makes to the JDK every three months or so creates extra work for them. But given that the technology keeps getting better, they aren't complaining.

Companies such as British Telecommunications plc and CSX Corp. are among those using the JDK to build newfangled applications that run across intranets and the Internet as well as multiple computer platforms.

Java applets are key to setting up network computing environments that include thin-client machines linked to centrally managed servers that host the applets.

Defining the JDK

While Sun and JavaSoft have raised awareness of Java as a new, object-oriented method of building networked applications, the JDK itself has kept a low profile.

It's an 8M- to 10M-byte package of programming tools that provides all you need to get started as a Java programmer. Sun has been giving the package away to corporate developers and licensing it to third-party software vendors since January 1996. About 600,000 copies have been downloaded.

JavaSoft last week posted the latest fix to the JDK Version 1.1.3, which is designed to remedy a Java security vulnerability identified by University of Washington researchers working closely with Sun (see story, this page). Version 1.1.2 was issued just last month.

The JDK contains a core set of APIs, a Java interpreter to execute Java byte code and an applet viewer to test Java applets. It also has typical programming tools, such as a compiler and a debugger.

Sun has delivered the JDK for Windows 95 and Windows NT, plus Solaris; a version for the Macintosh is due for release this fall. Third-party providers have ported the JDK to Windows 3.1, AIX and HP-UX, among other platforms. Last week, IBM announced a version for OS/2 Warp 4 and OS/2 Warp Server.

Keeping up with the new releases is worth it, users say, because Sun keeps adding fundamental improvements.

"JDK 1.1 did not merely add a lot of elements, it changed a lot of code," says Mark Elenko, a consultant with New York-based Fusion Systems Group. In particular, the tools for building graphical user interfaces has improved, he says.

Improvements in what's known as the Event

By Ellen Messmer

WHAT'S NEW IN THE JDK

Event Model — Lets programmers separate display and application logic for more flexible coding and performance gains.

Serialization — Makes sure objects sent from one place to another have not been altered during transport.

Remote Method Invocation — Allows Java applets running in remote Java Virtual Machines (JVM) to communicate remote procedure calls to each other via TCP/IP.

Security bug fix — Corrects vulnerability in the JVM's verifier that lets an attacker craft malicious byte code to crash a JDK 1.1 browser or read its memory cache.

Handler in the Abstract Windowing Toolkit (AWT) graphics piece of the JDK make it possible to write less bulky, faster applications, Elenko says. The software enables developers to separate display and application logic, he says.

"In 1.02, the Event Model was flawed and lent itself to fat-coding practices," Elenko says.

"When a user just moved a mouse around, it generated a tremendous amount of event handling," he says.

Java's new Event Model "makes it easier to change layouts and easier to extend with new layouts," says Iseult White, managing partner at Catalyst Solutions, a consultancy that develops Java-based applications for financial and insurance companies.

JavaSoft has been careful to maintain backward compatibility between JDK 1.1 and 1.02. However, many programmers say when a major shift occurs, like the one evident in the Event Handler, it's time to abandon the old.

Movin' on down the JDK line

Indeed, end users feel compelled to move on because they can't stay in the same spot once serious bugs in JDK are uncovered. And they're worried that if they lag even for a short time, the code they write will be obsolete and won't work when JDK 1.1 browsers arrive.

The changes in the JDK AWT have meant more work at Waltham, Mass.-based Mitsubishi Electric Information Technology Center America, where staffers are developing Java applications for internal use and commercial sale. It took a couple of days for the Mitsubishi programming team to upgrade the Java applications with an interface based on JDK 1.02 to an interface based on Version 1.1.2, says Michael Young, Mitsubishi principal engineer.

Upgrading to JDK 1.1 might seem like a thankless task right now because the only client software that fully supports Version 1.1.2 is Sun's own HotJava browser, Young says.

"We don't like HotJava because it tends to crash," Young says. "But a good reason to move up from 1.02 is that we're not sure how long the old Event Model will be used at all."

Mitsubishi uses the JDK as its primary tool kit, though it also keeps Symantec Corp.'s Cafe application development kit on hand.

That strategy makes sense, according to Gina Centoni, a product-line manager at JavaSoft. "You should look to companies like Borland [International, Inc.] and Symantec for these tools," she says.

The vendors promise to enhance the basic JDK with tools such as more powerful debuggers that can make programming easier and faster. The drawback with third-party tools is they may not always adhere to the very latest JDK update. But as corporate developers are finding out, that isn't easy. ■

JavaSoft stomps out another bug

Sun Microsystems, Inc.'s JavaSoft unit last week released a software fix designed to stomp out yet another security bug discovered in the Java Development Kit (JDK) used to build Java applets and applications.

The JDK 1.1.3 bug fix, available for download off JavaSoft's Web site (www.javasoft.com), corrects a vulnerability in the Java Virtual Machine (JVM) byte-code verifier that lets an attacker crash a JDK 1.1-based browser or read its memory cache.

The bug is said to have been discovered by University of Washington researchers working

closely with JavaSoft.

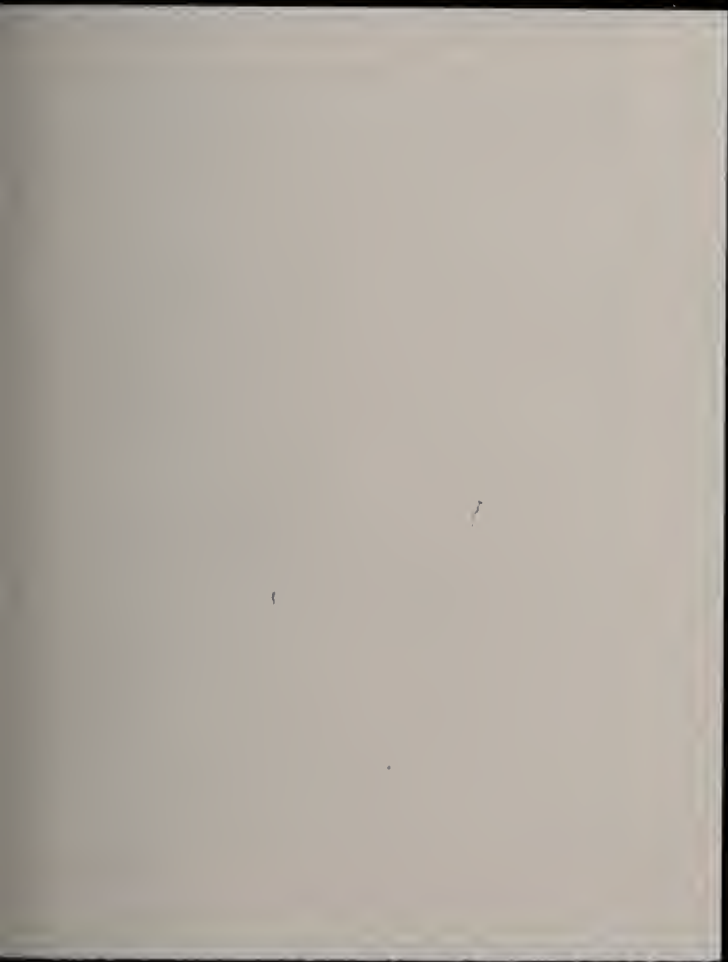
The only JDK 1.1-based browser available is Sun's own HotJava browser, and the researchers got it to crash, said Marianne Mueller, security staff engineer for JavaSoft.

"These kinds of bugs that get a browser to crash are inherently interesting to those who want to crash a system," Mueller added.

JavaSoft has changed its JVM verifier so an attacker will not be able to use the attack to read the contents of a user's applet or look into the browser's cache.

— Ellen Messmer







Technology Update

Covering: Evolving Technologies and Standards

NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I am beginning research on connection options to my local Internet service provider in order to hook up our network to the Internet. I would like advice on how to best link to our provider using fiber technology that is not super expensive. We will need a TCP/IP router on our end and some way of converting 10Base-T to fiber at both sites. I have not used fiber optics before and would like any opinions on fiber connection options.

Carl Thomas, systems administrator, city of Siloam Springs, Ariz.

The amount you pay for a fiber-optic connection to your ISP will depend on the local phone company's fiber-optic infrastructure, as well as the distance between those connections and your site and those connections and the ISP's facilities.

Actually, unless you are looking for connectivity speeds greater than a T-1 line's 1.544M bit/sec rate, fiber generally doesn't offer many advantages over copper.

However, it will provide some protection against voltage surges induced over the line as it feeds into your premises.

If you are fairly close to your provider, less than a couple of blocks away, the phone company may be able to run "dark" fiber between the locations. The phone company would simply run the cable from one location to another without providing any signal or service on it. You also might be able to get fiber pairs from a cable TV provider.

If you plan on running the fiber above ground, you'll need to get fiber that is encased in a gelatin-like material that allows it to stretch and shrink as the weather changes.

Also, consider deploying at least one extra pair of cables to switch over to in case problems crop up or network growth warrants additional capacity.

For your needs, 10Base-T should suffice. At 10M bit/sec, you should be able to hook directly to an Ethernet port on the ISP's router.

Switching routers answer the call for more bandwidth, performance

By Drusie Demopoulos

The widespread adoption of high-performance switching, increased centralization of servers and the rapid acceptance of Internet- and intranet-based communications are taxing today's router-based networks.

A next-generation communications product, known as a multilayer switch or a switching router, solves the connectivity and performance problems of today's routers and provides a foundation for growing bandwidth and quality-of-service (QoS) requirements.

The switching router melds Layer 2 and Layer 3 functionality using hardware integration and advanced silicon. Using hardware-based technologies that provide multigigabits of capacity, the products provide scalable bandwidth and capacity to the growing number of enterprises moving to Fast and Gigabit Ethernet speeds.

Switching routers perform Layer 2 switching and multiprotocol routing at wire speed. Such high levels of performance are achieved by integrating routing functionality into an Application Specific Integrated Circuit (ASIC). This "router on a chip" architecture enables switching routers to provide many times the performance of traditional routers.

Traditional routers use a processor to perform Layer 3 forwarding. In existing routed architectures, each packet is sent to a forwarding processor that performs next hop lookup and packet modification functions. When these tasks are complete, the packet is sent to the destination queue for delivery.

Switching routers streamline this process in two ways. First, they remove the processor from

the normal data forwarding path. All Layer 3 forwarding functions are performed when a packet is received, enabling the packet to be queued directly to the transmit path. Second, the router on a chip handles Layer 3 forwarding on the fly.

Another key performance-enhancing feature of switching routers is hardware-based Layer 2 and Layer 3 address resolution. In traditional processor-based routers, the most time-consuming activity is address lookup and resolution. Switching routers include Integrated Layer 2/

technology rather than higher priced processors are passed on to users.

Finally, the integration of Layer 2 and Layer 3 functions into a single piece of silicon reduces system costs even further. The benefits of this approach are clear when you compare switching router prices with those of traditional routers.

When a switching router is deployed in a network, endstations can communicate by means of Layer 2 or Layer 3 forwarding. The type of forwarding used depends on the subnet

between ports depending on whether a protocol is routable.

The hardware integration of a multiport Layer 2 switch and multiprotocol router into one package lets users greatly simplify their network infrastructure. For example, replacing one or two switches and a traditional router with a switching router enables multiple ports to perform as a switched subnet yet link to the router as a single entity.

Switching routers also can be used to increase network efficiency and decrease equipment costs by supporting virtual LANs.

VLANs are a grouping of users on a net regardless of their location. With switching routers, VLANs can be interconnected at Layer 2 or Layer 3. This allows the physical network infrastructure to be shared by multiple sub-

nets. For instance, multiple broadcast domains or VLANs can be connected to a single gigabit port on a switching router.

Multimedia applications are a driver for next-generation products such as the switching router. These applications require advanced network QoS services such as QoS and multicast. Switching routers include inherent QoS capabilities, such as priority queuing and flow control, that provide delay-sensitive applications with adequate bandwidth and consistent latency.

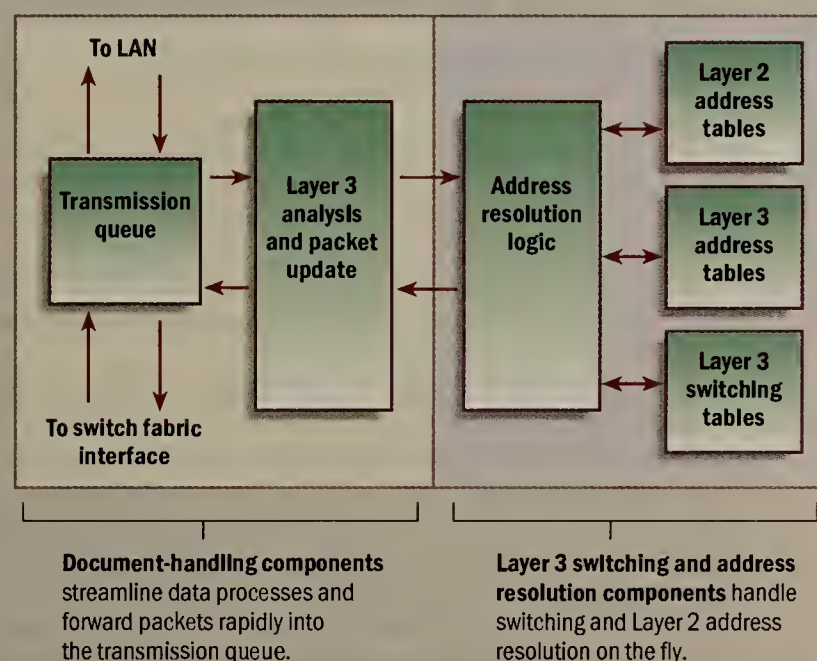
Switching routers are the next step in the evolution of the router and switch. Before the advent of these products, Layer 2 and Layer 3 technologies were often force-fit into existing environments at the expense of network performance and end-user satisfaction.

Faced with increasing loads, unpredictable traffic patterns and new applications, users and vendors clearly saw the need for a better mousetrap.

Demopoulos is vice president of marketing at Gigabit Ethernet start-up Foundry Networks, Inc.

UP CLOSE Anatomy of a multilayered switch chip

Multilayered switching routers depend on Application Specific Integrated Circuit silicon, dubbed a "router on a chip." The technology is key to multilayered switches that perform Layer 2 switching and multiprotocol routing at wire speed.



Layer 3 Address Resolution Logic that performs the high-speed address lookup and resolution needed to deliver wire-speed performance.

Cost savings

In addition to dramatic performance improvements, this hardware-based design approach produces significant cost savings. In contrast to traditional routers that include multiple processors, a switching router may be composed of only one processor, which handles topology protocols such as Routing Information Protocol (RIP) and Open Shortest Path First (OSPF). The cost savings realized through the use of ASIC

membership of the endstations. Subnets are portions of a network that share resources and are typically defined by their own net address. Traffic from endstations that belong to the same subnet is automatically forwarded at Layer 2, while traffic from stations belonging to different subnets is transported via Layer 3 forwarding.

Switching routers handle a full suite of protocols, including IP, RIP, OSPF, IPX and multicast.

However, many networks include nonroutable protocols, such as NETBIOS or DEC LAT, that do not recognize Layer 3 forwarding. When used in such environments, switching routers will automatically switch or route



Gigabit Ethernet and economic reality

Bay Networks, Inc.'s acquisition of Gigabit Ethernet start-up Rapid-City Communications two weeks ago lends credibility to this young, fast-paced market. But a look at the economics of Gigabit Ethernet shows some of the behind-the-scenes antics with which the industry is dealing.

The gating factor regulating the acceptance of high-speed LAN technologies is, of course, cost. The cost of Gigabit Ethernet network interface cards (NIC) is largely based on two components: fiber transceivers and the associated serializer/deserializer, called Serdes in the trade. The Serdes takes parallel signals from ASICs and turns them into a serial signal the transceiver can translate into pulses of light.

Vendors say that together these components represent a third of the cost of building a gigabit NIC. If the transceiver/Serdes combo costs \$250, for example, it would cost the vendor \$750 to build a NIC, which roughly reflects reality today.

To calculate the retail price for this board, the industry rule of thumb is to multiply the NIC cost by five. The markup accommodates the bite the channel takes and results in a comfortable profit margin for the builder. So this \$750 board would sell for \$3,750.

But the retail prices vendors are trotting out are in the \$1,500 ballpark, meaning vendors are forward-pricing. That is, they are setting

their prices based on what they think the transceiver/Serdes components will cost a year from now and taking a hit on profit margins in the short term.

One vendor said he expects the components that cost him \$250 today will only cost \$125 by this time next year, meaning it will cost \$375 to build a board. If the NICs still are selling for \$1,500, the five-to-one markup rule almost works, meaning profit margins return to normal.

However, conventional wisdom says "early adopters" won't start experimenting with a new technology until end-to-end connection costs drop to less than \$3,000, a price that takes into account the NIC and the switch port to which it is connected. Given that Gigabit Ethernet switches look like they will cost about \$2,000 per port, gigabit NIC prices will have to dip below \$1,000 to get the market going. That may involve another round of forward pricing. If components that cost \$125 in mid-1998 cost only \$60 in mid-1999, the boards could retail for \$900 while still providing traditional margins.

So the arrival of attractively priced Gigabit Ethernet technology will depend in large part on how willing NIC vendors are to put up with slim, short-term profit margins. My bet is competitive pressure will force them to rush ahead, pell-mell.

John Dix, editor

jdix@nww.com

Cost Management • John Danielson

Are you doing your part to cut network costs?

All organizations are keenly interested in lowering total cost of ownership (TCO), but not enough of them understand that it takes the active participation of both users and vendors to make it happen.

My company, Pacific Gas & Electric Co., has significantly reduced TCO by taking advantage of a number of cost-cutting opportunities. These can work for you, too.

First, make standardization a top priority. PG&E now has one network operating system, one e-mail system and a common PC configuration for all 21,000 of its users. This eliminated 50% of our management problems.

Second, implement standardized software installation and staggered rollout. Before rolling out a huge application or upgrade, send out multidisciplinary teams on pilots to find potential trouble spots. Establish standard installation procedures, then stagger rollout.

Third, control hardware purchasing and standardize support. Approximately 20% of our desktop problems happen during hardware change-out. So we created internal hardware standards to control the purchasing process and reduce any unknowns and potential problems. For hardware failure, which represents only 12% of IT problems but has huge ramifications, we have a standardized escalation process.

Finally, require fast response from a centralized help desk. We shoot for a response time of 20 seconds to answer the phone, 2 minutes to diagnose the problem and another minute to introduce a fix electronically or initiate a "tag" for somebody in the field to go out.

Beyond answering their phones quickly, what are some things vendors can do to help lower users' TCO? For starters, vendors should stress quality control. The cost of product failure escalates dramatically as it penetrates an organization. In addition to irreparable damage, it can compromise confidence in standards, encouraging people to do their own thing—which can be very costly to correct.

Vendors should also drive the standards process beyond what users are able to do. Users depend on vendors to work with industry organizations, adopt industry standards to improve interoperability and provide information about what works with what. However, standards only help users if vendors implement them. Vendors must implement these standards and use organizations such as the Open

User Recommended Solutions (OURS) group to understand users' needs.

Vendors should also provide standard tools for desktop support and centralized control over networked desktop systems. Users need standard products and services for tracking and logging information centrally. In addition, vendors should recognize the users' need for platform choice. In less than a decade, PG&E went from 100% dumb terminals to 90% PCs, 10% Unix. Today, about 30% of our installed base is mobile, 60% is PCs and 10% is Unix. We do not have NetPCs yet, but we probably will.

Vendors also should make it easier to remotely manage different configurations and platforms. We had two teams test the savings potential of remote management, comparing labor installations for 1,000 users of Windows 95. The savings with software automation were enormous: It took less than one-third the time to install Windows 95 remotely.

Finally, vendors should develop tools to convert legacy applications to Web-based applications. Users and vendors need to be actively thinking about how the Web can help improve the overall manageability of desktop and network systems.

Users and vendors share the burden of lowering TCO. Users must manage their resources efficiently; vendors must supply top-notch tools and embrace standardization. We have a huge stake in each other's success—this is an area in which, together, we can really get it right.

Danielson is vice president of computer and telecommunications services at Pacific Gas & Electric Co. and chairman of OURS. He can be reached at (415) 973-7000 or via the Internet at jcd1@pge.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

Fast Token Ring? Not

Regarding your article "Cisco cranks up Fast Token Ring" (May 26, page 1) and Kevin Tolly's column "The time is right for Fast Token Ring" (May 26, page 24):

There is no such thing as Fast Token Ring! Regardless of what the marketing types may want to call it, vendors are employing IEEE 802.3 100Base-T Fast Ethernet between switches that support 4M and 16M bit/sec token-ring segments. This has nothing to do with so-called Fast Token Ring—a technology that simply does not exist.

Your article correctly refers to Cisco's Inter-Switch Link tags and the new IEEE



Get on board the directory train

The recent announcement of a directory alliance between Cisco and Microsoft has some people scratching their heads. But to those of us who are familiar with directory services and networking, the intersection of these technologies was inevitable.

Two years ago, I discussed this intersection in a column about virtual LANs. At the time, an IEEE working group was being formed to define VLANs. I urged the industry to imagine a fully virtual network, not just a scheme for creating broadcast domains.

With such a network, you could use a directory service to drag and drop users, servers and other network objects into common groups and define the security and access rights for each group. By hitting a few more keys, you could configure the network so it knew which users and resources belonged in which VLAN groups and, through physical connectivity, enforce the access rights you defined.

The Cisco-Microsoft alliance can deliver on that vision and more. Directory services can enable a new administration model for networks. Instead of managing network devices — and associated users — based on their IP or media access control addresses, directory services allow you to manage logical entities, including devices, addresses, users, network services and applications — and their relationships.

This ability to define relationships between directory objects is at the heart of policy-based network management. Through directory services, corporate network managers and service providers will be able to define a set of policies — including security and quality-of-service (QoS) policies — applied on a user or group basis. In a world where IP addresses are assigned dynamically, it is imperative to tie access controls, bandwidth privileges and other service and control functions to users.

In 1995, when I first broached the question of directory integration with officials at Bay Networks, Cisco, 3Com and Cabletron, they inevitably asked: Which directory? For Cisco, at least, this question has now been answered. Cabletron also is looking to provide integration with Active Directory. Officials at Bay Networks and 3Com have not yet committed to supporting any particular directory. When I asked the four vendors which API they would support, the Lightweight Directory Access Protocol emerged as the answer.

A directory is a natural place for policy information to reside. Alternately, directory information could be extracted for use by a policy server. We're likely to see vendors implement both models.

An important aspect of the Cisco-Microsoft agreement is the two companies will

collaborate on extending the schema in Active Directory to accommodate network objects such as routers, LAN switches, ATM switches and remote access gear. To their credit, the two companies have indicated they'll propose this directory schema to the relevant standards bodies.

Once this work is done, Cisco and other vendors will be able to use Active Directory and other similarly enhanced directories as a repository for network management information and services, such as IP management via the Domain Name System and the Dynamic Host Configuration Protocol (DHCP).

For example, if a DHCP service used a directory such as the Novell Directory Service or Active Directory instead of creating its own directory, it could store a user's IP address as an attribute of the user object.

Similarly, personalized services parameters for users will be stored and managed as objects in the directory. This capability holds enormous potential for service providers that are eager to offer customers a tiered set of services. Directory services will be the foundation for differentiated Internet connectivity services beyond flat-rate access. Internet service providers will charge customers based on class-of-service or QoS policies, which they will manage via directory services.

Directories also are essential for implementing seamless secure access, including single sign-on, between private intranets and the Internet. In addition, directories offer a way for corporate customers to share service-level information — such as security and bandwidth requirements — with ISPs, allowing their organizations to use the Internet as an extension of their intranet.

These benefits won't materialize overnight. Few organizations and service providers have deployed a directory service. And work needs to be done to extend existing directories to encompass network objects and make directories interoperable.

However, it's clear that widespread use of directory services will simplify management of the network infrastructure as well as facilitate intercompany collaboration via the Internet. Corporate customers and service providers that don't have a directory strategy in place need to begin the planning process now if they want to reap the benefits of this technology next year.

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802.1q specification, both of which support virtual LAN capabilities or VLAN trunking and can be used to support the encapsulation of 4M and 16M bit/sec token-ring frames within 100M bit/sec Fast Ethernet frames.

However, the article does not explain how the larger token-ring frame sizes are accommodated over Fast Ethernet.

Do the switches perform frame segmentation or must a common maximum transfer unit (MTU) size be negotiated?

Your article also points out that "there are still a significant number of token-ring shops out there — many of which are conservative customers such as financial institutions — that are sticking with token ring."

If these institutions are so conservative, why do they risk running such an overpriced, nonmainstream technology as

token ring?

Contrary to Tolly's opinion, token ring's so-called deterministic access method is a farce because it cannot guarantee a constant bit rate — it only ensures that everyone's performance degrades equally.

In addition, virtually none of today's protocols and applications support token ring's priority reservation scheme.

Tolly goes on to propagate the worn-out myths about the limitations of "Ethernet's collision-based architecture," stating that "as the LAN gets busier, throughput continues to degrade." The performance of any network will degrade as demand increases — even token ring.

Tolly also states that "the need for microsegmentation and dedicated LANs became critical years ago for Ethernet." This may be true, but Tolly fails

to mention that a plethora of cost-effective Ethernet switch products are readily available from dozens of vendors.

He also neglects the fact that Ethernet switches are available that support 10M, 100M and even 1,000M bit/sec connections and that many operate in either half or full duplex.

This stuff is cheap and easy to use — anything [that's] token ring will cost at least five to 10 times more.

*Buddy Shipley
Vail, Colo.*

Editor's response: NW's use of the term "Fast Token Ring" was intended to tie the story to Kevin Tolly's column by borrowing his phrase.

It was not intended to debate issues such as encapsulation or fragmentation of token-ring frames running over 100M bit/sec media.

The story was also meant to merely inform readers on how Cisco and other vendors plan to increase

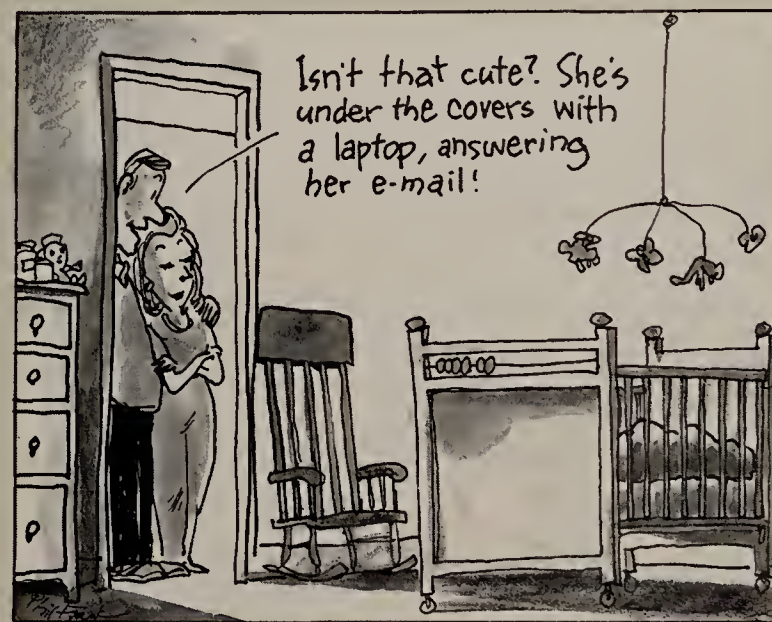
the speed of token-ring LANs.

Your points about frame segmentation and common MTU size are good ones that we will explore once vendors start to announce and ship 100M bit/sec token-ring

products.

The point of Tolly's column was to address the practical options for existing token-ring users, not continue the "token ring vs. Ethernet" argument.

Teletoons



Phil Frank and Joe Troise baba@sigate.com



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Feature

IP calling

Continued from page 1

Internet telephony is emerging as a means of shipping corporate voice and fax traffic around the world at cut-rate prices. And that's just the start. Longer term, companies may see other benefits from applications that merge voice and data traffic over IP nets, enabling them to support Web-enabled call centers, for example, and voice/data conferencing using live whiteboards.

Vendors ranging from Lucent Technologies, Inc. to Micom Communications Corp. to Array Telecom, Inc. are coming out with Internet telephony gateways and software for carrier and corporate environments that make voice and fax IP-friendly. A few smaller carriers and Internet service providers are taking advantage of these products to offer IP-based fax and voice services.

The larger carriers and ISPs have been slower to jump on board, pointing to integration problems and the lack of "carrier-grade" equipment. But you can expect their tune to change as smaller players force their hands and more equipment starts to trickle out.

The case for IP telephony

The economics of IP telephony are compelling, given that you can squeeze anywhere from five to 10 times the number of voice calls over the same bandwidth as compared to traditional circuit-switched voice, and an even greater number of fax sessions. This makes it possible to make calls over the Internet for one-half to one-third the cost of current long-distance calls. The savings can be greater for international calls and applications such as fax or message retrieval, which don't have the same delivery time requirements as real-time voice.

Companies that spend just \$10,000 per month in voice/fax calls among a few sites would be able to recoup an investment in Internet telephony servers for each site "in less than a year if you're only making domestic long-distance calls; perhaps as little as three months if you have one or more international sites," says Michael Sargent, vice president of marketing at Inter-Tel, Inc., a vendor of IP telephony systems. The savings amount to 30% to 40% for domestic calls and as much as 50% for international calls, he says.

"Internet telephony is for real," says Christopher Mines, senior analyst at Forrester Research, Inc. in Cambridge, Mass., and author of the soon-to-be published report, "Internet Telephony Grows Up."

Jeff Pulver, president of Pulver.Com, a leading IP telephony consultancy, is similarly bullish. "I expect that at least 50 of the Fortune 500 [companies] will have production-class IP telephony systems in use by the end of 1997," he says. "But we won't necessarily know who," he adds, "since they will consider this to be strategic and, therefore, not necessarily public knowledge."

"One of the prime applications that will

flourish first is fax," says Rebecca Wetzel, director of Internet consulting at TeleChoice, Inc., a consultancy in Verona, N.J. She says fax is a natural because latency isn't as much of an issue as it is with voice, and fax accounts for about 40% of the average Fortune 1,000 company's phone bill. "You can save up to 40% of that piece by putting fax over IP,"

Wetzel says. "The technology is a perfect match."

"As soon as you can get guaranteed end-to-end service levels from your providers, real-time voice will follow," notes Patrick Fetterman, IP telephony product manager at Natural Micro-Systems, Inc., a manufacturer of voice boards for IP telephony vendors.

The stumbling blocks

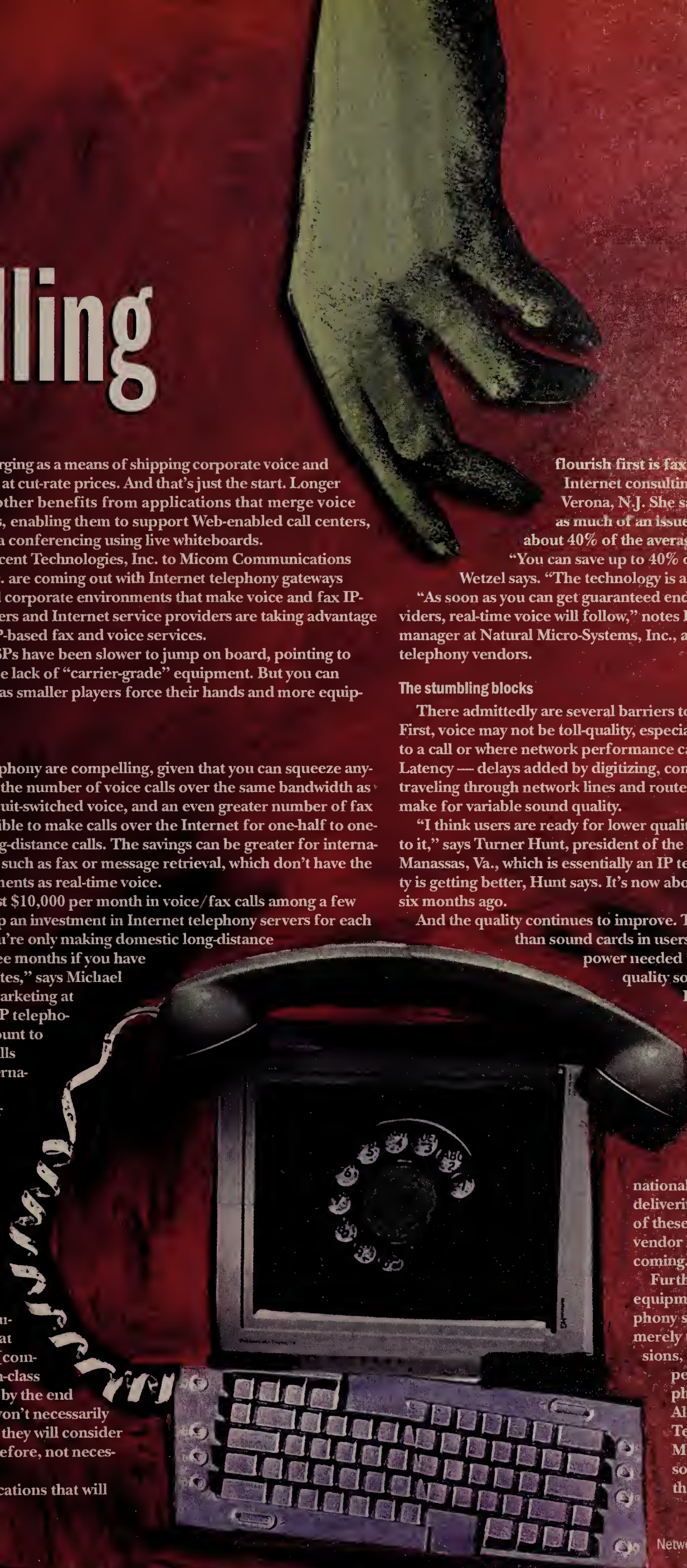
There admittedly are several barriers to deployment and use of IP telephony. First, voice may not be toll-quality, especially where limited bandwidth is allocated to a call or where network performance causes some packets to be lost or ignored. Latency — delays added by digitizing, compressing and packetizing and by packets traveling through network lines and routers — adds inescapable delays, which can make for variable sound quality.

"I think users are ready for lower quality calls . . . cellular has gotten them used to it," says Turner Hunt, president of the Global Exchange Carrier Co. (GXC) in Manassas, Va., which is essentially an IP telephony wholesaler. Plus, IP voice quality is getting better, Hunt says. It's now about 85% of toll quality, up from 65% as of six months ago.

And the quality continues to improve. The use of server-level products rather than sound cards in users' computers provides the processing power needed to minimize latency and provide high-quality sound.

IP telephony offerings to be used in corporate networks and applications also need traditional voice features such as conferencing, call forwarding and the like, plus advanced billing and accounting systems. The services also will need to integrate with PBXs and automatic call distributors (ACD). Vendors including Inter-Tel, Lucent, Rockwell International Corp. and Vienna Systems Corp. are delivering products that address at least some of these issues, although integration with multi-vendor PBXs and ACDs may be some time in coming.

Furthermore, ISPs and carriers will need equipment comparable in scale to today's telephony switches — capable of supporting not merely tens or hundreds of concurrent sessions, but tens of thousands. This hasn't happened yet, but expect to see big IP telephony switches from vendors such as Alcatel Telecom, Lucent, Northern Telecom, Inc. and Vienna Systems. An MCI Communications Corp. spokesperson expects the first such switches out in the first quarter of 1998.



A SAMPLING OF INTERNET TELEPHONY PRODUCTS

Vendor	Product	Comment
Broughton	IP/FaxRouter	• Routes fax traffic from Ethernet LANs over IP nets
Dialogic	GateNet	• IP telephony gateway for small offices
	DM3	• High-end, telco-grade IP telephony platform
Infor-Tel	Communications Server	• Includes call processing and voice processing products, plus unified messaging software
Lucent Technologies	Internet Telephony Server Internet Call Center	• Routes fax and voice traffic over intranets and the Internet • Delivers voice calls generated by a user browsing the Web to a live call center agent
Milcom	V/IP Phone/fax IP Gateway	• Digitizes and routes intracompany voice and fax over IP; connects to PBX and key telephone system
NetXchange	Internet Xchange for Fax	• Routes faxes over IP
ViaDSP	PacketTel	• Computer telephony boards and software to build IP voice/fax gateway servers
Vienna Systems	Various gateways and servers for IP and LAN-based telephony, including call processing products	
VocalTec	VocalTec Telephony Gateway	• Phone-to-phone and fax-to-fax calling over IP nets
Array Telecom	Telegate	• Windows NT-based IP telephony server; can squeeze up to eight calls onto a single ISDN line

You can find hot links to all the vendors listed here on Network World Fusion.

www.nwfusion.com

As usual, standards are another issue. On the client side, the H.323 standard has already been approved, and virtually all vendors are bringing their products into compliance, according to Mike Jablon, Internet telephony evangelist for IBM's Internet division. Standards for gateways that connect IP nets to traditional phone networks will take longer. "It'll probably be 18 to 24 months before they are interoperable," Jablon says.

Servers for sale

Still, you can outfit your net with gateways from a single supplier to get IP-based voice telephony on an intracompany basis. Hardware and software are available from several dozen vendors, including those in the chart above.

Board-level and server-based products are available not only for building IP telephony systems, but also for integrating them with existing PBXs, LANs and ACDs. In general, the products support Digital Signal Processing, digitizing and compression/decompression of analog voice, and gateways between IP-based nets and the public telephone net (see graphic). Some servers and gateways also have accounting features.

Dave Pearson, manager of new technology at *The Boston Globe*, has been following announcements of such products carefully. He's looking at IP telephony to reduce costs and improve customer service in the *Globe's* two call centers for subscriptions and classified ads. He also envisions using it to support voice traffic among the *Globe's* 40 sites in Eastern Massachusetts.

When a customer logs on to the *Globe's* Web site to place a classified ad, Pearson wants the customer to be able to click on an icon and forge a voice connection to a human sales representative, without needing to place a separate phone call.

"I want one single network," he says. "We've used [interactive voice response] technology to reduce costs and enhance

service. I see the Internet as another alternative — not a replacement, but another vehicle to reach out to the customer."

Money is also a motivation, of course.

"We use Centrex. The installation charge for a Centrex ISDN line is about \$800, and the display phone is another several hundred dollars. There are huge incentives to reduce that cost," he says, "but it's too early to say whether [Internet telephony will bring] cost savings or just good customer service."

Reports from early implementers indicate the cost savings, at least, will be there.

Lucent, for example, reports one user of its Internet telephony gateway is a German company that was having trouble hiring people to handle customer service outside of normal office hours. The company is now hiring people living in Florida and is using Lucent IP telephony systems to provide voice and computer connections between Florida and Germany, significantly reducing the costs of long-distance communication, according to a Lucent spokesman.

Other Lucent customers getting ready to use IP telephony include a Japanese company linking its local offices with offices in New York and elsewhere and a regional ISP that is looking to become a voice value-added reseller.

IBM's Jablon says as part of a skunk-works project, his group looked at IP telephony gateways from a number of companies before choosing to install a gateway from VocalTec, Ltd. in four offices, with another four coming online over the summer. In an effort to understand how IBM customers will use the technology and what business opportunities it might present, employees in those offices have been using the equipment to support production voice calls.

"People are surprised at the quality of the call — pleasantly surprised," Jablon says. "It's better than cellular."

He says the technology is viable as is in campus environments to support

voice and data over a single wire for thousands of users. "And that campus can be distributed, with some people in New York and some in London or Tokyo," he adds.

The carrier picture

As for what carriers and ISPs are doing with the technology, it's a mixed bag. There are some limited offerings from major ISPs, notably PSINet, Inc., which is partnering with NetCentric Corp. in Cambridge, Mass., to offer lower cost fax delivery service, with digitized faxes flowing over PSINet's data network as TCP/IP packets. But the most ambitious deployments are coming from smaller or lesser known players.

GXC, for example, is building an international IP telephony backbone network based on gateways from Vienna Systems, an Ottawa-based vendor of PBX-like IP telephony call processing and gateway servers. It will resell the service to other carriers, which will offer lower cost voice and fax calling to business and residential end users.

The initial network will consist of eight gateways, one in each of eight countries,

9,000 users. Calls made through Rimnet's network cost 60 yen for three minutes, close to half the cost of the maximum for a long-distance call in these areas.

According to Drew Freyman, president of Rimnet, users report quality as being 70% to 90% of regular phone quality, and 85% of the users say quality is "better than cellular."

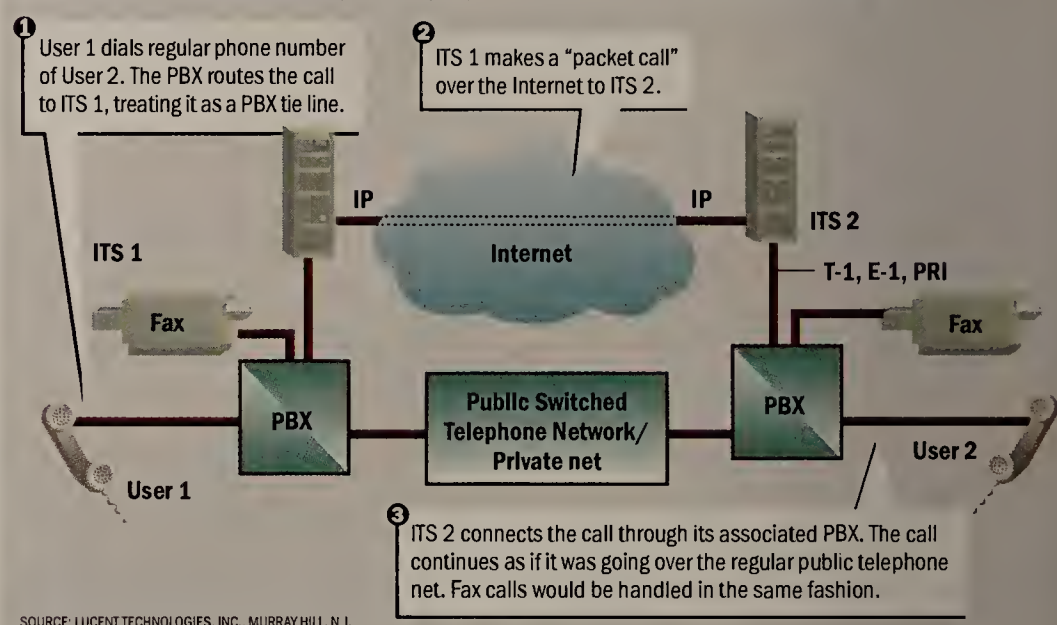
Domestically, big-name ISPs and carriers haven't been as quick to embrace Internet telephony, although they are certainly not dismissing it. PSINet has its fax offering but isn't promising to add voice any time soon. "There are no fundamental technology obstacles; it's a big integration problem" in terms of connecting the IP and voice networks and billing systems, says Chuck Davin, vice president and chief technical officer at PSINet. Scalability is also an issue, he says.

UUNET Technologies, which is owned by WorldCom, Inc., is showing even less interest.

"We haven't seen much demand yet," says Allan Taffel, vice president of marketing and business development at the company. "All of our growth is coming from other areas — standard business

A TASTE OF INTERNET TELEPHONY AT WORK

How Lucent's Internet Telephony Server (ITS) routes voice or fax calls over the Internet:



including Germany, Israel, Japan, Korea, New Zealand and the U.K., with another dozen gateways soon to follow.

Business appears to be booming. The GXC service began in June 1996 — GXC claims to be the first company to carry and bill Internet voice calls — and is now handling about 200,000 minutes of usage per day, using only about 15% of GXC's current capacity, with usage at least doubling monthly.

While minuscule compared with the current total global calling volume, which is about half a trillion minutes of usage annually, GXC's activities show use of IP telephony is growing fast.

Rimnet Corp. in Tokyo is another Vienna Systems customer. It has deployed IP gateways in six of Japan's largest cities, with 600 lines from these gateways to the country's public switched telephone network (PSTN) — enough to serve about

applications moving over to Internet technologies."

Carriers including AT&T, MCI and Sprint Corp. are eyeing or trying out IP telephony but say they can't roll out service until large-scale switches are available. MCI, for example, currently uses a Wintel-based card from DiaLogics Corp.

"It works well but has a limited capacity, like a T-1," says Robert Hagens, director of Internet engineering at MCI. "You're not going to offer a service to 100,000 customers with a box like that."

Hagens says MCI is waiting for vendors such as Nortel to deliver carrier-class switches. "When you see a box with the capability of 10,000 DS-0s, you'll see larger carriers rolling out services that correspond to that," he says. An MCI spokes person says you can expect to see trials in selected areas in the third quarter of 1998.

Go online for more about Internet telephony:

- An explanation of what makes voice over IP work
- A historical account of an early IP-based voice application
- A link to pulver.com, the Jeff Pulver site, where you'll find lists of gateway providers, video and audio products, tools and plug-ins as well as lots of other resources

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Meanwhile, Sprint says lack of carrier-class switches makes it difficult to develop a business case for IP telephony.

"The cost elements are still unknown at this point," claims John Heiman, acting director of Internet telephony at Sprint. "The carrier-grade gateways, such as for large ISPs, are only in beta. I don't think we have enough information to build a cost model for packet vs. circuit in terms of what's more economical."

AT&T may be a bit ahead of its rivals. According to Pulver, the carrier is looking at "four classes of service: 'A Class,' which is PSTN toll-quality long distance, through 'D Class,' which gateways to and from IP." An AT&T spokesman wouldn't confirm or deny that report.

"We view Internet telephony as a potentially large opportunity," the spokesman said, although he claims AT&T has only "preliminary thoughts" as to what form a service might take. "But we are in a position to move into that area if it takes off or shows promise of taking off," he says, pointing to the firm's established WorldNet Internet service and experience with enabling technologies, including speech compression and voice packetization.

Visionaries see IP telephony as having the potential to finally bring together data and voice in ways that have long been discussed but have never come to fruition.

"Long term, as [the technology] becomes ubiquitously embedded, you'll see a new class of applications commingling the best of data and voice, such as Web-enabled call centers and data sharing with whiteboards," Natural Microsystems' Fetterman says.

Kent Elliot, president and CEO of Vienna Systems, sees other applications as significant. "People will use IP telephony to do bridged conference calls that also include presentations and data, and to let people in a sales force chat."

Other uses will be for remote staff, such as a salesperson overseas, to connect via the Internet to their office phones not just for messages, but also to have the full calling privileges of their office phone, along with voice and document conferencing.

"It's time for users to start experimenting," says Forrester's Mines. "Do a trade-off analysis of your own capabilities: Do you want to buy or outsource?"

He says to look at your traffic patterns, particularly for fax and international calls, to find areas where IP telephony might fit.

The nice thing about Internet telephony, Mines points out, is "companies can do it incrementally location by location—it's not an all-or-nothing decision."

One thing is clear: If you've got significant fax or international phone bills,

don't wait for your phone company to come to you with their plan to save you money. If you aren't spending enough to justify your own servers, check with your ISP and keep your eyes open for newcomers and smaller carriers that may offer Internet telephony in the areas you want. When enough users start shifting services to the Rimnests of the world, the AT&Ts won't be far behind.

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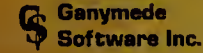
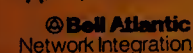
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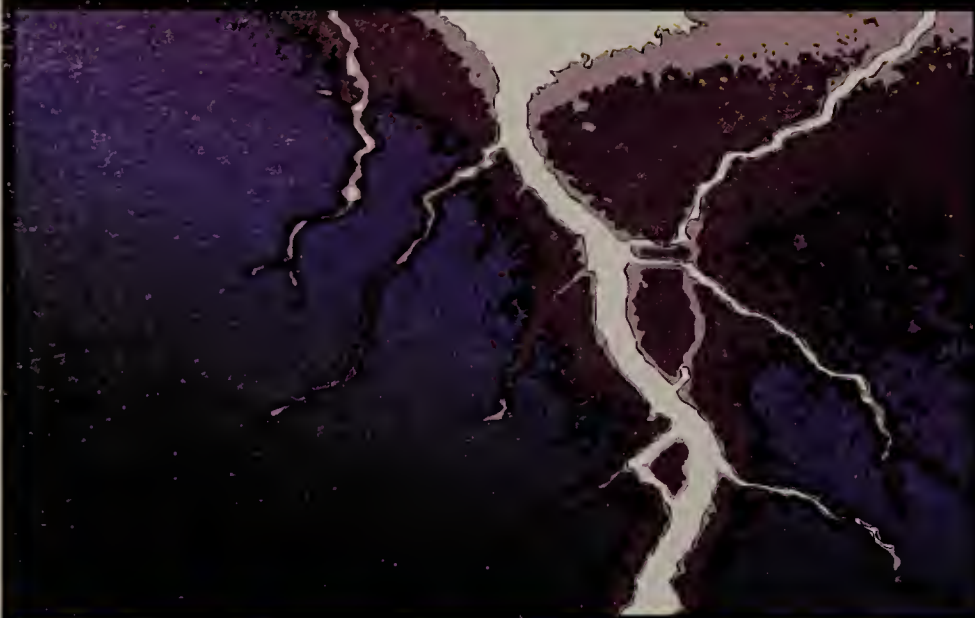


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Intranet whirlwind

*Compact Devices' Twister brings
files to the Web quickly and easily*

By Lee Schlesinger



Web servers don't get much simpler than Compact Devices, Inc.'s Twister. In a box no bigger than a pair of modems comes all the software you need to set up and customize a department Web server. Twister's virtues are its simple installation and maintenance. Its main drawback is its inability to do more than file serving.

Twister comprises a 1G-byte SCSI hard drive and utilities to quickly turn it into a Web server.

Hardware setup is simple. Plug in a power cord, connect the unit to a 10Base-T cable and you're done.

Software installation isn't much more complex. Compact Devices includes a diskette with a BOOTP utility called Instant IP that you can install on any Windows 95 or NT workstation.

With it, you specify the media access control address of the Twister server and the IP address you want to assign it, turn on the machine and watch a status field as the server configures itself. You can also specify an IP address via Reverse Address Resolution Protocol or on a command line via serial connection.

You now have a working, albeit not yet

and sample sites you can use as templates for creating your own pages.

With the hardware, Compact Devices packages Claris Corp. Home Page, a basic page authoring tool, provides a hyperlink to and license key for Net-It Software Corp.'s Net-It Now document publishing tool.



If you need more storage, you can expand Twister by connecting another SCSI device to the provided Centronics SCSI connector.

You can add only one additional read/write drive; other storage must be read-only.

Any SCSI drive you add must be formatted with a Twister configuration utility before use, so you can't simply add preconstructed content. You can also add as many as five CD-ROM drives to the SCSI bus.

The information can then be accessed from a browser or File Transfer Protocol (FTP) by specifying a device name.

Twister does a good job of serving up intranet files via HTTP, FTP and Trivial FTP, but because it uses a proprietary Web server/operating system stored in flash memory, you can't add third-party executables. That means no proxy server or client/server audio or video software.

Still, at \$1,095, Twister is an affordable, speedy way to quickly get a department or workgroup sharing files. ■



terribly useful, intranet server. When you first access it, you see a home page and a setup wizard for configuring the box.

Here you specify a supervisor password and choose a basic security model. You can let anyone read and write Twister directories, or you can reserve write privileges to the supervisor.

This doesn't prevent you from setting up individual accounts whose users can write to their own directories. When you do so, still within the setup wizard, Twister automatically creates a subdirectory for each user.

At the end of the setup process, you can customize Twister's default home page to give it many different looks.

If you're an experienced administrator who disdains wizards, you can access a main configuration page that lets you zoom to the task you want to perform.

In addition to any files you create, Twister comes with a number of graphic elements

NetResults

Product	Twister
Vendor	Compact Devices, Inc. (800) 894-0519 www.devices.com
Price	\$1,095
Pros	▲ Easy installation and administration
Cons	▼ Functionality limited to file sharing ▼ Limited expandability

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■ **NetStart, Inc.** is readying its **TeamBuilder 2.0** electronic recruiting application for shipment at the end of next quarter. The major upgrade features a fax module for scanning resumes directly into a common database. Hiring managers can evaluate and collaborate over corporate intranets via Java-based browsers. TeamBuilder 2.0 also can post job listings to NetStart's CareerBuilder (www.careerbuilder.com) site, where they can make their way to leading career sites.

TeamBuilder 2.0 requires a 120-MHz Pentium PC or equivalent with 32M bytes of RAM and 30M bytes of disk space running Windows 95 or NT Workstation 4. It costs \$7,200 per server for unlimited users and \$8,700 for the fax module add-on.

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■ **Learning Tree International** has rolled out a series of one-day advanced **Power Seminars**. The following are now being offered in Washington, D.C., Chicago, Boston, New York, Los Angeles, Irvine, Calif., San Francisco and Santa Clara, Calif.:

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- Additional courses will debut in August. Each course costs \$349, with discounts available.
- © Learning Tree: (800) 843-8733.

Play both sides of the fence with contract and permanent jobs

Many IS workers know it is not a question of which type of work to choose but when.

By William Gower

Do you want career flexibility, or would you rather have stability?

There's no need to choose — you can have both by mixing contract and permanent IS

the lure of high contract pay often outweighs the need for job stability and the security that comes with a permanent position.

Another top draw for contracting is the flexibility and freedom to choose your own projects.

As a contractor, you're in control of the kind of projects you agree to complete.

Not only do you have the flexibility of deciding what projects to take on, but you also can decide to leave a company if the assignment

valued member of the organization, you're more involved in decision making and have more opportunities to climb the corporate ladder.

While a contract assignment allows you to move on, a permanent position allows you to move up.

Fortunately, you don't always have to decide which one, but rather when. Regardless of your decision, you'll find companies willing to embrace it.

Many companies, particularly in the IS industry, want people resources better matched with

their respective desires and skills. They want more focused and productive IS professionals — whether contract or permanent.

Gower is a founder of MATRIX, which serves the Atlanta, Dallas and Phoenix markets. His IS industry experience spans 30 years, including positions at IBM and Comshare, Inc. He has been counseling permanent and contract IS professionals since 1981. You can reach him at bill_gower@MatrixRes.com.

WORKING FOR A LIVING

Whichever type of work you choose, contract and permanent employment offer distinct benefits.

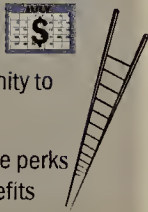
Contract:

- High pay
- Flexibility
- Freedom to move on
- Variety of assignments



Permanent:

- Regular paycheck
- Stability
- Opportunity to advance
- Corporate perks and benefits



work. The key is knowing which type of position is right for you and when.

Although each option has its benefits, one may be more suitable for you at a certain time in your life. But that doesn't mean the other won't be a better choice later.

A mixture of contract and permanent employment throughout your career can be the best recipe for success.

Know when to be a free agent

In today's IS market, the world of contracting has become more accepted.

Contracting is no longer just a trend — it's becoming a way of life. With the nature of the IS industry leaning toward project orientation, it's not surprising that contracting has become an accepted strategy for doing business.

One in five Atlanta-based IS professionals would consider a contract position, according to an independent study sponsored by MATRIX Resources, Inc., an IS placement firm in Atlanta.

The leading draw of contract employment to those surveyed is money, meaning lots of it.

For young IS professionals,

isn't what you want, without necessarily damaging your career — a major benefit when you're trying to find a company that fits your needs.

And when to join the team

At some point, however, you may want a job that provides more security and a chance to move into a management position.

As a permanent employee, you have the stability of working for just one company and knowing exactly where your next paycheck is coming from.

You also have the security and assurance of receiving company medical benefits, 401K plans, vacation time and other perks that don't often come with a contract position.

Of course, benefits do come with a contract job when you team up with a placement firm that provides benefits for you.

In the MATRIX survey, 25% of the IS professionals interviewed expressed concern that contract workers are treated like outsiders — one reason some prefer a permanent position.

When you work for one company, you're able to build a strong, ongoing relationship, and you're part of a group. As a

Be careful what you call yourself

Who is — or isn't — a contractor? According to the Internal Revenue Service, some 90% of cases it tracks involve workers who have not properly qualified themselves for status as an independent contractor.

The IRS has established the following 20 factors of common law to determine an employee or independent contractors. Published in the IRS Manual 4600 Employment Tax Procedure, Exhibit 4640-1, these factors suggest you are of general employment status — and not an independent contractor — if you:

- Must comply with your employer's instructions about work and procedures
- Receive training from, or at the direction or supervision of, your employer
- Provide services that already are integrated into the existing business
- Provide services that must be rendered on a personal basis.
- Are responsible for hiring, supervising and/or paying assistants for your employer
- Have a continuing working relationship with your employer
- Must follow an established schedule
- Work full-time for your employer
- Do your work on the employer's premises
- Must do your work in a sequence set by your employer
- Must submit regular reports to your employer
- Receive pay of regular amounts at set intervals
- Receive pay for business and/or traveling expenses
- Rely on your employer to furnish needed tools and materials
- Lack a major investment in the facilities you use to perform service
- Cannot make a profit or suffer a loss from your services
- Work for one employer at a time
- Do not offer your services to the public
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— William Gower

Go online for articles on the legal aspects of contract employment as well as handy tips for managing temporary workers.

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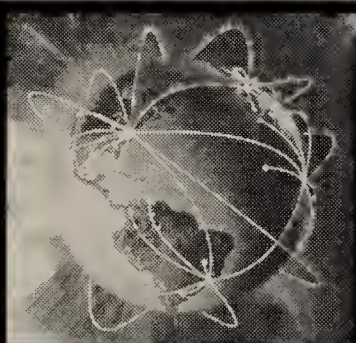
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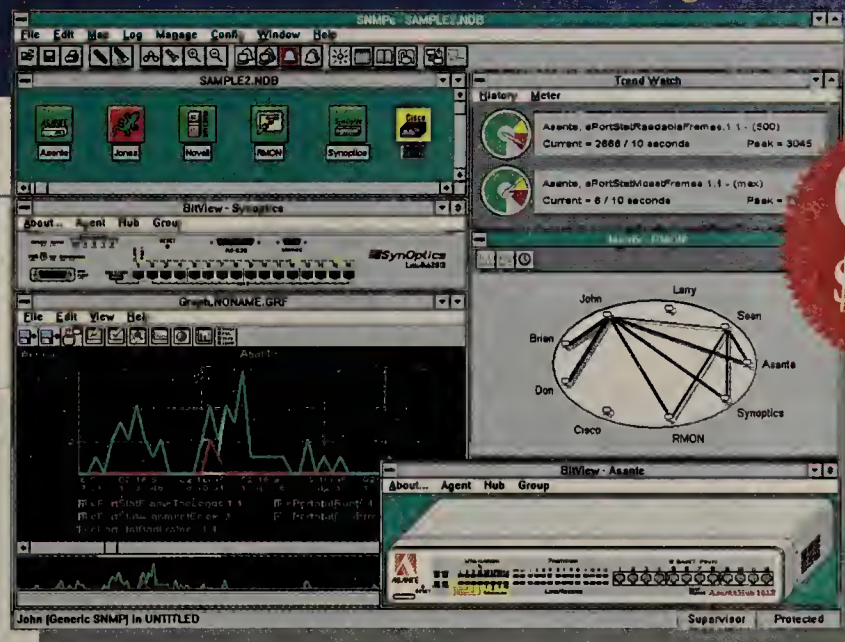
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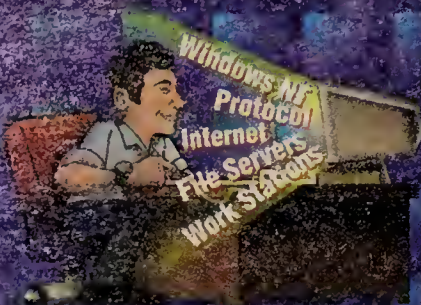


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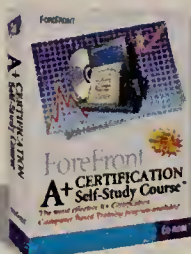
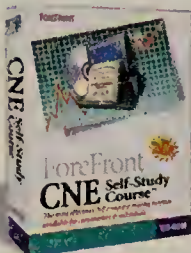
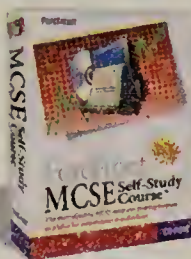


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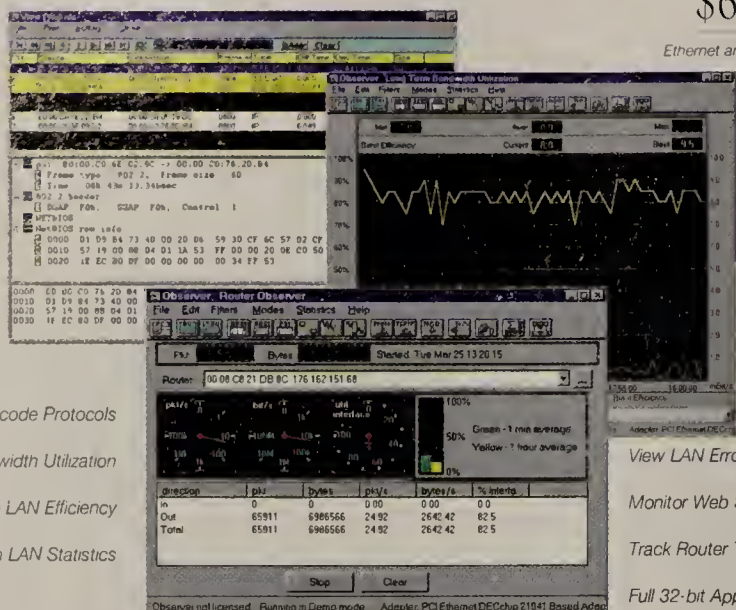
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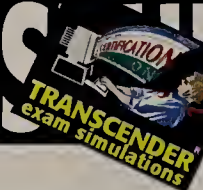


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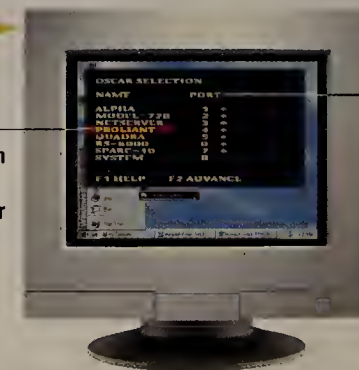


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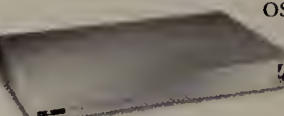
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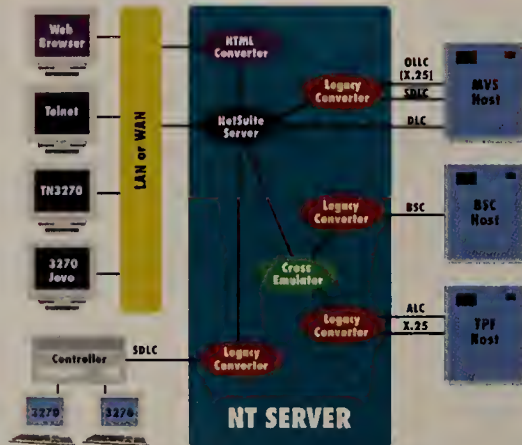
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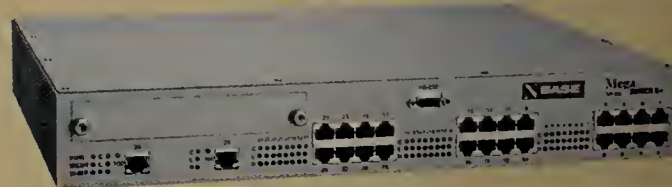
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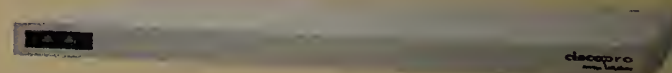
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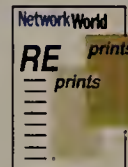
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Torrent

Continued from page 1

said Gordon Saussy, vice president of marketing for Torrent. Torrent is not looking to displace the 7500 but to augment networks, specifically for Web-based sessions and transactions.

Saussy declined to detail the architecture and configurations of Torrent's routers, which will ship in the fourth quarter. He did say, however, that the highest speed ports on the devices would be Gigabit Ethernet. He also said the routers will contain an algorithm that will allow the boxes to forward tens of millions of packets per second and support 150,000 active routes. That is well above the number of routes in some of the largest enterprise networks.

"That looks like a pretty decent size," said Don Miller, an analyst at Dataquest, Inc. in San Jose, Calif. "It's plenty of capacity on an enterprise net."

Cisco, though, recently announced a new processor for the 7500 that enables the router to support 250,000 routes.

The Torrent algorithm also enables each line card in a Torrent router to perform wire-speed route table searches, Saussy said. The Torrent router can identify and queue flows without adding extraneous bits, or "labels," to packets. Labeling is the basis for Cisco's Tag Switching and other routing scalability architectures. Instead, the IP header itself is the tag, he said.

"There's a new breed of router coming that provides classic IP and true QoS," or quality of service, Saussy said of the Torrent products. Intranets that need to establish service priority for SNA sessions hosted on the Web would find this capability

appealing, he said, as would those doing IP Multicast video.

Cisco's GSR also distributes route forwarding tables to line cards via a feature called Express Forwarding. And Saussy admits that Torrent's algorithm bears some similarity to Express Forwarding.

But again, Cisco is targeting GSR at ISPs and charging carrier-

PROFILE: TORRENT NETWORKING TECHNOLOGIES

- Based:** Landover, Md.
Founded: August 1996
Management: Hemant Kanakia, CEO and chairman (formerly with AT&T Bell Laboratories); Gordon Saussy, vice president of marketing (formerly with 3Com and Chipcom)
Products: Next-generation backbone routers, which will enter customer trials this summer and become generally available in the fourth quarter
Funding: \$5 million from Columbia Capital, Draper International India Fund and individual investors

class prices; Torrent's routers will be offered to enterprises within the price range of a Layer 3 switch, Saussy said, which is a fraction of the price of a backbone router.

Torrent joins other start-ups, such as Jupiter Networks, Inc., Avici Systems, Inc. and Pluris, Inc., aiming at the fast-router market (NW, March 17, page 1).

Torrent was founded in August 1996 by Hemant Kanakia, current chairman and CEO. Kanakia developed switching architectures for AT&T Bell Laboratories. Saussy also is a network industry veteran. He has been in the business since the early 1980s and has held executive marketing positions at Chipcom Corp. and 3Com Corp. ■

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ATM

Continued from page 1

that it might just be easier to stick with a technology that we already know," said Giroux, director of information systems at West Valley/Mission College in Saratoga, Calif.

ATM gurus like John McQuillan, president of McQuillan Consulting, Inc. of Concord, Mass., and chairman of the ATM Year '97 show, did not go quite so far as to concede the campus to technologies other than ATM. But he did make it clear that ATM's chief role will be in WANs.

What's spooking ATM?

Among the biggest issues for ATM is Gigabit Ethernet. This technology, which is expected to be standardized in early 1998, carries data at 1G bit/sec while retaining the Ethernet frame format.

Many analysts think customers will prefer to use a familiar,

Inc. are hedging their bets.

ATM cannot even boast having superior multimedia capabilities anymore, observers said.

Although once thought limited to the ATM world, QoS capabilities soon will be available in Gigabit Ethernet switches using IP protocols like Resource Reservation Protocol.

Customers will no longer have to make the leap to ATM to gain the benefits of bandwidth reservation and other key QoS parameters necessary for handling multimedia traffic.

Ironically, IP Switching also has stolen much of ATM's thunder. IP Switching was originally proposed by Ipsilon Networks, Inc. as an ATM-centric method of zipping IP traffic across a network.

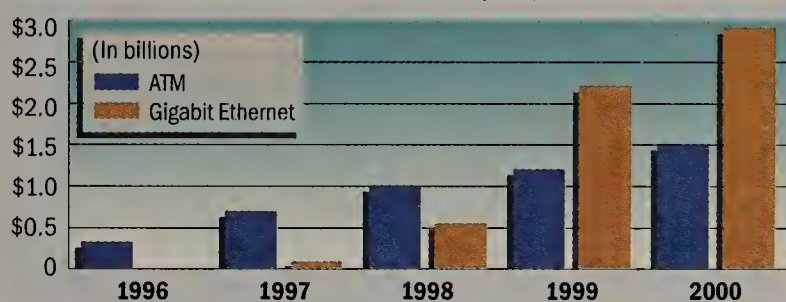
But the industry is now embracing the idea that IP can be switched using a frame switch or gigabit router, eliminating the need for ATM switches.

And so it seems difficult to discern any significant ATM advan-

"Customers like to upgrade their networks because it reinforces a correct earlier decision. They hate to have to replace anything," says John McQuillan of McQuillan Consulting.

WATCH OUT ATM, HERE COMES GIGABIT ETHERNET

Worldwide sales of Gigabit Ethernet switches will top those of ATM switches by 1999, according to market research firm Dataquest, Inc.



frame-based technology for simplicity and easy integration with existing networks.

"Customers like to upgrade their networks because it reinforces a correct earlier decision, and they hate to have to replace anything because it is an admission of error and can be expensive and complex to start over," McQuillan said. And that does not bode well for ATM.

Before Gigabit Ethernet's emergence, ATM was the only speedy backbone game in town. So customers could justify the leap to ATM — and all the new equipment and training that went with it.

ATM hardliners such as FORE Systems, Inc. are still very much focused on ATM in the backbone, but others such as 3Com Corp. and Cisco Systems,

tage over frame technologies like Gigabit Ethernet, Bell said.

"ATM's advantage over frames isn't bandwidth, it isn't QoS and it isn't price," Bell said. "So the ATM community has left the door wide-open for the Ethernet people to come in with a good alternative."

The only advantage ATM may still hold over Gigabit Ethernet is timing. ATM is the sole choice for customers who need a high-speed, multimedia LAN backbone today.

But it will only be about 18 months before Gigabit Ethernet gear with all of the ATM-like features is widely available, industry observers said.

"Just like some strong trees won't survive in a forest because they are shaded out by bigger trees, a lot of excellent technol-

ogies just don't make it and never take root," McQuillan said. ■

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CDA

Continued from page 1

industry to come up with a technical means to keep children off the meaner streets of the Internet through what it calls a "computer V-Chip."

In a vote of 7 to 2, the Supreme Court decided the CDA violates the First Amendment right to freedom of speech. It is a violation because the CDA's notion of "indecent" was so vague, a sweeping online censorship would have resulted from this misplaced effort to protect children in cyberspace.

But the effort by the Clinton administration and children's

advocacy groups to find a way to make the Internet a safe playground for kids is hardly over.

"There is clearly material on the Internet that is inappropriate for children," the president said last week after the Supreme Court rebuffed the Department of Justice's argument that the 'Net should somehow be reengineered to check for age.

"In the coming days, I will convene industry leaders and groups representing teachers, parents and librarians," the president stated.

"We can and must develop a solution for the Internet that is as powerful for the computer as the V-Chip will be for the television," he said.

Clinton added, "With the right technology and rating systems, we can help ensure that our children don't end up in the red-light districts of cyberspace."

What shape that effort might take remains to be seen.

The Supreme Court noted in its decision that, at present, it appeared "untenable" to try to check for age on the Internet.

"This argument ignores the fact that most Internet forums — including chat rooms, newsgroups, mail exploders and the Web — are open to all comers," the Supreme Court noted in its landmark ruling.

Some children's advocacy groups said their understanding of the Supreme Court ruling is that it still will be possible for

Congress to regulate content on the Internet, as long as new legislation is not as broad as the ill-fated CDA.

The battle isn't over

The Washington, D.C.-based Family Research Council, which fought hard for the CDA, last week said it will not give up the battle.

"The Supreme Court ruling means that pornographers can open their doors to children on the Internet," said Cathy Cleaver, Family Research Council legal policy director.

However, she said her organization will be asking Congress to draft new legislation because the Supreme Court suggested that "more narrowly tailored provisions could be upheld."

Those who fought against the CDA are worried that Congress

will indeed try its hand again at regulating Internet content.

"Prodigy hopes that with [the Supreme Court] decision, Congress does not continue down this path," said Marc Jacobson, Prodigy, Inc. vice president and general counsel.

The Supreme Court said the CDA essentially would have banned discussion on the Internet about birth control, sexual practices, artistic images of nude subjects, scientific subjects and even the Carnegie Library's card catalog.

"The breadth of the CDA's coverage is wholly unprecedented," the court said.

Supreme Court Justice Sandra Day O'Connor, who voted against the ruling on the CDA, said she is convinced that the CDA was an attempt by Congress to create "adult zones" on the Internet.

The creation of such zones can be done to preserve freedom of speech. ■



President Clinton doesn't want children to "end up in the red-light districts of cyberspace."

Bay

Continued from page 1

that could support up to 48 622M bit/sec OC-12 links or 30G bit/sec, said Brian Brown, director of product strategy for Bay's Switching Products division.

Bay also is developing a multi-gigabit frame-based backplane for the switch that will enable it to support 240 10M/100M bit/sec autosensing Ethernet ports in conjunction with new 24-port 10/100 modules, said Dave Kutilek, director of product management for Bay's Enterprise Business group.

Maximum power

Currently, the System 5000 maxes out at 48 155M bit/sec OC-3 ATM links and 160 switched 10M and 70 switched 100M bit/sec Ethernets, officials said.

The new backplanes should increase ATM bandwidths by a factor of four and frame bandwidths by more than threefold.

The new Ethernet backplane will be available in the first half of 1998. It will be based on Application Specific Integrated Circuit technology that Bay obtained from its acquisition of NetICs, Inc. earlier this year. The cell-based fabric is targeted for release by the end of 1998, Bay officials said.

Existing System 5000 users will be able to preserve and upgrade existing 14-slot chassis with the new offerings, Bay said.

Also on the docket for System 5000 is a DS-3/E-3 WAN module, officials said. The WAN cards will enable users to build ATM metropolitan area networks in excess of 45M bit/sec with the System 5000 and give the switch WAN access without going

through a router.

The WAN cards will be available in the first half of 1998, and Bay will support the ATM Forum's Multi-Protocol over ATM routing technology on System 5000 at that time, Brown said. That will allow users to do Layer 3 switching between LAN segments on an ATM backbone, he said.

Bay also is investigating the development of circuit emulation cards for System 5000, Brown said. This will enable users to attach voice network gear, such as PBXs, to the System 5000 for an integrated voice/data infrastructure.

Alive and kicking

These developments come as Bay prepares to equip the System 5000 with mainframe channel attachments and assume IBM SNA LAN gateway functions (NW, June 9, page 1).

"The System 5000 is very much alive and well," Kutilek said of the four-year-old switch. Bay has shipped more than 35,000 of the 14-slot chassis, he said. "It's not going away by any means; it's becoming more and more strategic," Kutilek said.

And all these switching enhancements do not come at the exclusion of shared-media extensions, Kutilek said.

Bay is also developing 24-port 10/100 autosensing shared-media Ethernet modules for the System 5000. They decided to develop these modules because a significant portion of the company's revenue is still tied to shared-media connectivity, Kutilek said. ■

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Lucent's new small PBX lowers entry point to Definity G3 family

By David Rohde
Murray Hill, N.J.

Lucent Technologies, Inc. last week unveiled a new remote office PBX that is more closely related to Lucent's flagship Definity voice switch than its existing branch office options.

The new product — Definity ProLogix Solutions — is designed to give branch locations a migration path to Lucent's Definity G3 PBX. The trade-off for users is a higher initial price than key systems and other voice-switching options for smaller offices.

ProLogix supports locations with 40 to 500 stations, while the Definity G3 can support as many as 25,000 stations. To upgrade from one to the other, users trade in their cabinet and control circuit cards but keep their port circuit cards, software and peripherals.

The ProLogix PBX is priced at \$400 to \$700 per seat, compared to the typical \$350-per-seat price of Lucent's popular Merlin Legend, a hybrid key system and PBX that is not upgradable to Definity.

Lucent also offers a small-office version of Definity called the Definity G3vs, so named because it is considered "very small." But that PBX contains

only 10 circuit-card slots in a single cabinet, while the ProLogix model can be made up of three cabinets. The G3vs also typically uses different software than the larger G3 models. ProLogix will use the same upcoming Definity Release 6 software as the big models when it is available in September.

For users with multiple sites, Lucent will offer an optional hardware and software package that enables the use of a uniform dialing plan. The plan enables users to identify calling parties from remote locations with the G3 or ProLogix.

That feature appealed to Bob Oberst, telecommunications manager for the service affiliate of Old National Bancorp, a bank holding company in Evansville, Ind. Following a series of mergers that left him responsible for 23 banks with 150 sites in three states, Oberst is now buying 30 Definity switches, most of them the ProLogix model, with private lines to cut out long-distance tolls.

Oberst considered the Merlin Legend and the G3vs, but neither scaled properly or offered

feature compatibility with the larger G3 at his operations center. "We were undecided what to do until ProLogix came out," he said.

Configuration options

Lucent's Definity ProLogix PBX supports:

Total number of ports: 600

Maximum number of ports on the station side: 500

Maximum number of ports on the trunk side: 400

Examples: The product can support 300 telephone stations with 300 lines to the public network or 500 stations with 100 lines.

The networking package costs \$1,585 to install and \$3,500 for the first 100 ports. In the past, Lucent sold the networking package for G3 locations only in increments of 1,000 ports.

Lucent also will sell Definity ProLogix Solutions as a stand-alone PBX for small-to-midsize businesses. The company will devise an "exit strategy" for the G3vs once ProLogix slips, said Sonny Hudson, integration manager for Lucent's Business Communications Systems division. ■



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1997

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8. Understand the alternative approaches to running SNA applications over frame relay
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10. Analyze case studies of various network types to see how frame relay can be best implemented
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12. Learn about new and likely future service enhancements which could impact your network

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Backspin

Their eyes have it! Tracking and hacking the ways of the world

Ever had neighbors who spied on you? You know, the curtain twitchers who seemed to watch your every move. But more people are watching you — a lot more.

There's the camera on the ATM and one in the bank foyer. There are cameras in the mall and train stations. And cameras at road intersections and on freeways. Some of the latter can measure the speed of your car and automatically issue you a speeding ticket.

<digression> Let me just note here that many people seem to have a problem with this. It seems they are concerned that someone is taking liberties with their civil liberties. I don't get it. What exactly is intrusive about this? Answers on a postcard; best one gets an "I digress" T-shirt. <digression>

And then there are Internet cameras — hundreds of them. Just check out Yahoo's listings at www.yahoo.com/Computers_and_Internet/Internet/Entertainment/Interesting_Devices_Connected_to_the_Net/Spy_Cameras/. There are about 300 entries and Yahoo is not even close to having an exhaustive list.

I have a theory. Within five years, the vast majority of public urban spaces, I bet more

In five years, most public urban spaces and 50% of nondomestic spaces will be under surveillance.

than 70%, as well as 50% of private, nondomestic spaces will be under surveillance. Furthermore, I predict most of the public cameras will be publicly accessible.

Now what are the consequences? You'll be trackable not only by the authorities (police, CIA, FBI, IRS and so on) but by *anyone else* who wants to track you.

"How on earth could THEY do that?" you may well be asking. Easy. All someone will need is your license plate number, car details — model and color — and pattern-matching software. Then, with a little bit of smart picture-gathering, THEY could follow your path.

Smart picture-gathering simply requires that THEY know which cameras are possible viewpoints to the next stage of your

route and THEY sample only those.

Sure, you might stop and change vehicles or go down a road that isn't monitored. But even if you get out of your car, THEY can find you.

Can't you just see the scene in THEIR control room? The monitoring software determines that too much time has elapsed and, therefore, you have stopped or changed transportation. So scanning is now instituted for all cameras in your last known vicinity.

"Aha," you're saying, "how will that help without a license plate to track? After all, pattern recognition for complex stuff like faces isn't easy."

Listen Buster, don't get cocky with me. White Pine Software (www.wpine.com) recently released CU-SeeMe 3.0, which includes a product called FaceIt by Visionics. According to White Pine: "FaceIt is real-time face recognition software. It allows a computer connected to a video camera to automatically detect human presence, locate and track heads, extract face images and perform identification by matching against its database of people." Cool.

The next step? Build FaceIt software into an embedded processor in the camera to improve response and reduce bandwidth demand. Just send the camera a template to watch for, and it returns the image when the target is found. THEY will love it!

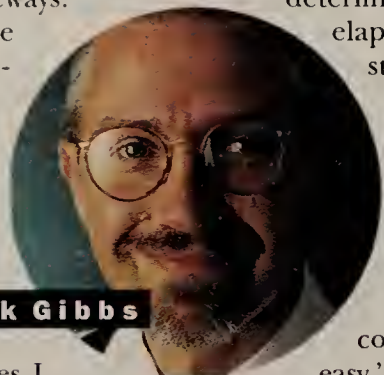
Now combine that information with credit card and digital cellular data that, unlike analog cellular, can be located, and we all become completely trackable.

So want to know what your husband is up to? No problem. Via the Internet you contact the Virtual Detective Agency and request they monitor your spouse tonight.

Ding! E-Mail arrives. He's left work. Seconds later, ding! Another message: He went straight to the bar and bought two beers. Hmm. Ding! He's deviated from his journey home. What could the dog be up to? Ding! He is about to appear with a dozen red roses purchased at the florist on Main and First. Don't you feel bad for doubting him?

Wait a second, he's in the network business and used to be a hacker, so can you actually trust the information? You — and the neighbors — watch him arrive. The roses are yellow. Hmm.

Don't pretend you don't have an opinion! Let me know at nwcolumn@gibbs.com or on (800) 622-1108, Ext. 504.



Mark Gibbs



'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

NO NETSCAPES IN THIS BUNCH The Internet initial public offering (IPO) market of 1997 is looking more and more like a bad professional sports draft.

With six months down and six to go, there are no franchise Internet players visible, no potential Michael Jordans or Netscapes available on the board, only undersized role players hoping to make it on heart, hustle and hype.

Of course, that is better than trying to make it on hype and "concept," a strategy that led to a number of high-profile Internet stock pratfalls in the second half of 1996.

While we're all for prudent management and conservative investing, the activities do nothing to quicken the pulse. And neither do the handful of Internet companies that have filed IPOs in 1997. After all, how excited can you really get about an online bookstore?

Here's a look at some of the Internet players that should be available to stock investors in the second half of '97:

- **@Home Corp.**, Mountain View, Calif. Filed IPO on May 16; offering date to be announced (TBA).

This developer of cable-based Internet access has some good word-of-mouth going for it, and Microsoft's recent deal with ComCast makes the technology seem more viable, which should attract shareholders. But as with last year's search engine companies that went public, @Home is deeply in debt and has no real profit plan other than its bet on the convergence of television and Internet technology.

- **Concentric Network Corp.**, Cupertino, Calif. Also filed IPO on May 16; offering date TBA.

Concentric develops and installs virtual private networks (VPN) and offers Web hosting and flat-rate Internet access. The company better hope its VPN business takes off — and its recent deal with Netscape should help — because almost no one is going to get rich hosting Web sites and providing connections to cyberspace.

- **fine.com Corp.**, Seattle. Filed May 9; expected to go public any time now.

The company builds and maintains Internet and intranet sites for corporations. We suppose there's money, if not glamour, in Web carpentry. Nonetheless, such companies are no more than utility players in the big picture.

- **On Village Communications, Inc.**, Calabasas, Calif. Filed March 5; offering date TBA.

Online yellow pages and information directory that draws revenue from advertisers. Hey, this isn't 1996!

VALUABLE BAG OF COOKIES Undeterred by the Great Internet Cookie Controversy, a group of six investors has poured \$40 million into **DoubleClick, Inc.**, a New York-based start-up that uses cookie technology to track users' Web surfing habits for advertisers.

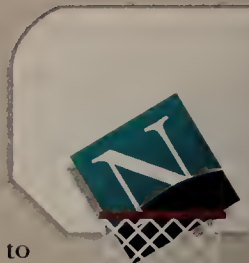
DoubleClick and similar services have come under fire in recent months from Internet privacy advocates that say cookie technology employed to target ads and compile user profiles violates Web users' rights.

Advocates of cookies say the technology makes Web surfing more convenient by allowing things like automatic recall of site passwords. They also say such technology is necessary to make 'Net advertising pay off.

A standards proposal under consideration by the Internet Engineering Task Force would make it easier for users to prevent cookies from being sent to their computers.

Investors in DoubleClick include **Greylock Management, Bain Capital, ABS Capital, Venrock Associates, Canaan Partners and Weiss, Peck & Greer.**

While we've never donated \$200 million to any libraries like some showoffs we could mention, we've negotiated a settlement on our overdue book fines, which should count for something. Make your Internet and intranet news count for something by telling 'Net Buzz. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.



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Since the way you use your network has changed dramatically, now is an excellent time to question its conventional design. Put simply, your rigid system isn't equipped to handle the fluid movement of intranet traffic, Internet access, and new applications that take advantage of both. Enter Adaptive Networking.

cornerstone technologies: Access, Switching, IP Services, and Network Management.

Q • WHAT ABOUT RELIABILITY?
When your network goes down, so does productivity. Not to worry. Adaptive networks are inherently more

provides the powerful ability to visualize and analyze real-time traffic flow across your entire network. Intelligent agents monitor your network infrastructure, keeping your IT staff informed of changing conditions and often making adjustments as needed. What's more, Optivity includes analytical tools for capacity planning to help reduce budget surprises.

Q • WILL IT WORK WITH WHAT I'VE ALREADY GOT?
Of course. It wouldn't be

truly adaptive if it didn't. You can adopt this technology at your own pace in cost-justifiable increments. Adaptive Networking even makes our competitors' products smarter and faster. Good news, since you probably already own some.

Q • CAN IT GIVE MY BUSINESS A COMPETITIVE EDGE?
Definitely. You can offer hot, new services and build closer links with customers and business partners. Should they need access to your corporate network from the Internet, you can offer secure virtual private network connections. Want to add voice-over-IP capabilities to link customers and service representatives from your Web site and reduce long-distance phone costs? Adaptive networks can do this and much more.

Adaptive Networking

Q • ALL RIGHT, WHAT IS IT?
Adaptive Networking is a set of products and cornerstone technologies that transition today's networks to the IP-optimized networks of tomorrow. The aim of Adaptive Networking is to build networks that are invisible to users, worry-free for network managers, and strategic for the business.

Q • WHAT DOES IT OFFER?
Our philosophy is centered around more services with less complexity. How? Through transparent scalable technologies that ensure long-term, non-disruptive network evolution; drive operational productivity at every level of the organization; and adapt to changes in network usage and business requirements.

Q • WHAT ARE THOSE SCALABLE TECHNOLOGIES?
Bay Networks products are being developed around industry-leading

reliable and scalable thanks to symmetric multiprocessing and a distributed architecture. In other words, there's no single point of failure to bring down your network. Moreover, the system automatically reroutes traffic as needed to avoid bottlenecks. And you can easily add to, change, and modify your network without disrupting users.

Q • HOW CAN I REDUCE NETWORK OWNERSHIP COSTS?
Adaptive networks automatically find and configure new devices to save your IT staff considerable time. And thanks to our Autosensing Technology, the system determines which users have 10Mbps or 100Mbps capabilities, for example, and matches them with the bandwidth they need.

Q • HOW CAN WE AVOID SURPRISES?
With Optivity®, your IT staff can proactively manage all the devices in your network as one cohesive system—even if it extends across the Internet. Optivity also

Q • WILL IT WORK WITH THE LATEST APPLICATIONS?
Applications drive your network needs. That's why adaptive networks shift on the fly to match routing priorities to your applications. For example, financial transactions and video conferencing can take routing priority over e-mail packets and Web browsing.

ANY QUESTIONS?

If your network can't do all of this, it's time to start asking a few questions of your own. For a free strategy paper, visit www.baynetworks.com/adapt/a6 or call 1-800-8-BAYNET ext. 297. Adaptive Networking is exactly what your business needs. Without question.

